Vol. 904 Number 3

OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

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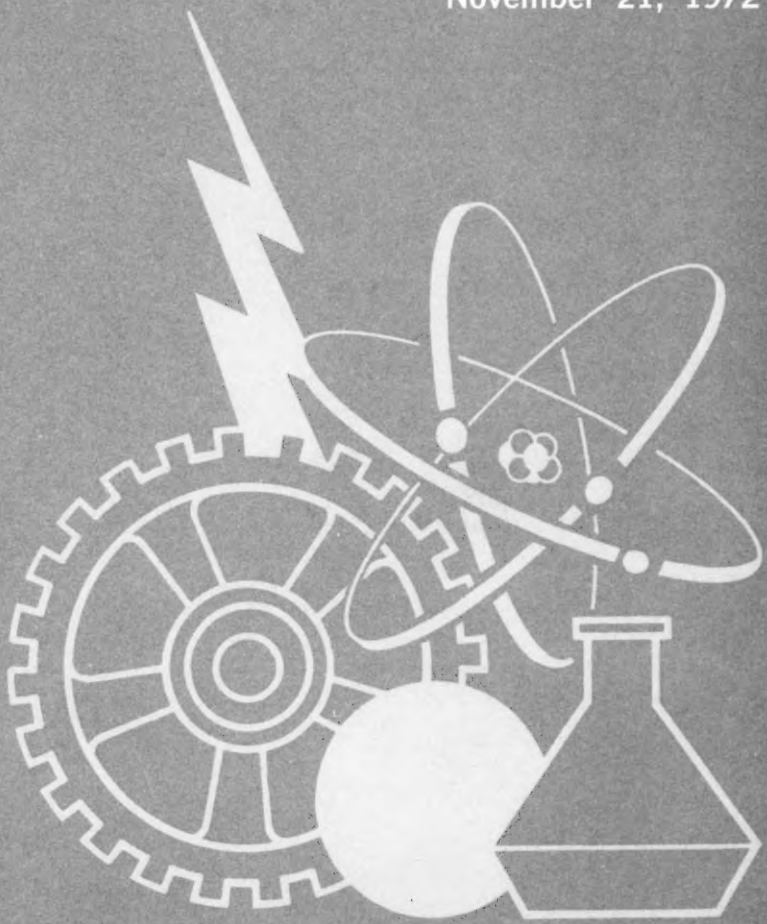
A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

November 21, 1972



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

November 21, 1972 Volume 904 Number 3

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PATENT OFFICE NOTICES

Certificates of Correction for the Week of Nov. 21, 1972

D. 223,179	3,627,796	3,646,727	3,657,849
3,378,516	3,627,946	3,646,997	3,658,666
3,439,042	3,628,936	3,647,335	3,658,676
3,469,244	3,630,216	3,647,453	3,660,510
3,549,301	3,630,578	3,647,918	3,660,535
3,558,688	3,630,819	3,648,050	3,660,589
3,575,699	3,631,074	3,649,717	3,660,841
3,588,409	3,632,345	3,651,250	3,661,102
3,589,936	3,632,987	3,651,434	3,661,753
3,598,180	3,633,926	3,651,454	3,661,821
3,598,913	3,634,030	3,651,465	3,661,980
3,600,619	3,634,658	3,651,800	3,662,024
3,601,809	3,636,017	3,652,430	3,662,755
3,603,413	3,636,142	3,652,636	3,664,462
3,609,079	3,636,412	3,652,648	3,664,716
3,609,379	3,636,673	3,652,935	3,665,158
3,612,621	3,636,815	3,653,376	3,666,361
3,614,707	3,637,925	3,653,427	3,666,496
3,615,353	3,639,584	3,654,529	3,666,752
3,615,378	3,639,608	3,654,579	3,667,267
3,616,122	3,640,469	3,654,956	3,667,466
3,616,801	3,642,074	3,655,126	3,667,479
3,621,406	3,642,435	3,655,717	3,667,980
3,622,879	3,642,748	3,655,735	3,668,500
3,622,913	3,644,356	3,655,783	3,670,002
3,624,500	3,645,618	3,655,796	3,671,155
3,625,636	3,646,023	3,656,011	3,672,547
3,626,666	3,646,216	3,656,215	3,674,418
3,627,772	3,646,688	3,657,211	3,680,017

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,233,950, Max Baermann, PERMANENT MAGNETIC BEARING, decided Mar. 15, 1972, Interference No. 96,739, claims 1, 2, and 5.

Patent No. 3,321,925, Clarence W. Shaw, DEEP WATER LAY BARGE AND METHOD, decided June 26, 1972, Interference No. 96,691, claim 1.

Patent No. 3,434,073, John F. Forkner, RAPID ACTING LASER Q-SWITCH, decided June 9, 1972, Interference No. 97,162, claims 1 and 2.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF OCTOBER 31, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-19-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	7-07-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-09-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	8-09-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—Director (Vacant). Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-04-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	3-08-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	10-11-71
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-01-71
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—Director (Vacant). Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-16-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-09-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts: Household, Personal and Fine Arts.	3-30-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-01-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	8-02-71
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	9-23-71
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	12-06-71
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	9-15-71

Expiration of patents: The patents within the range of numbers indicated below expire during November 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,721,999 to 2,725,857, inclusive
Plant Patents..... Numbers 1,427 to 1,435, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED NOVEMBER 21, 1972

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T904,018
COATING COMPOSITIONS

Keith W. Kroon and George P. Kasper, both % Eastman Kodak Co., Kodak Park Division, Rochester, N.Y. 14650

Filed Mar. 4, 1971, Ser. No. 121,119
Int. Cl. H01j *1/62*
U.S. Cl. 250—80
No Drawing. 16 Pages Specification

Coating compositions comprising nearly equal parts, by weight, of a mixture of (1) a polymethylmethacrylate with (2) a copolymer of ethylacrylate, acrylic acid and acrylonitrile are disclosed. When used in radiographic elements like phosphorescent screens they exhibit high flexibility and provide good protection as a clear, bubble free layer when coated from an aqueous dispersion or latex containing from about 5 percent to about 40 percent by weight of said mixed polymers.

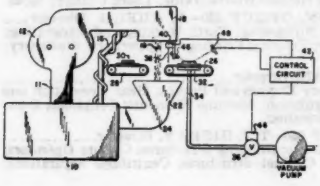
The phosphorescent screens protected with these overcoats can be used in combination with light sensitive radiographic elements which in turn exhibit improved optical and physical characteristics.

Silver halide emulsions and elements useful in integral or non-integral combination with the above-screens can be chemically sensitized, e.g. with noble metal sensitizers alone or in combination with sulfur or selenium sensitizers. They can contain spectral sensitizers, incorporated color-forming couplers, incorporated developing agents, antifoggants, hardeners, plasticizers, coating aids, vinyl polymers, and other suitable photographic addenda such as described in U.S. Pat. 3,297,446 of Dunn issued Jan. 10, 1967 (columns 4 to 9).

T904,019
METHOD AND APPARATUS FOR CONTROLLING DRAW DOWN OF PLASTIC COATING PROCESS

James E. Huffaker and Carl L. Terrell, both of P.O. Box 511, Kingsport, Tenn. 37662

Continuation of abandoned application Ser. No. 787,414, Dec. 27, 1968. This application Apr. 19, 1971, Ser. No. 135,508
Int. Cl. B29c *19/02*; C23c *13/08*; G01n *2/26*
U.S. Cl. 156—272
3 Sheets Drawing. 14 Pages Specification

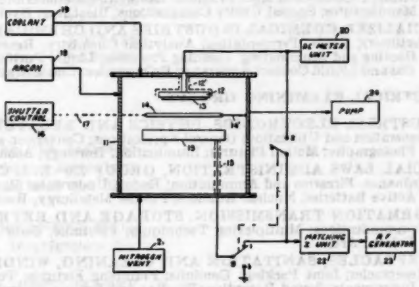


The drawdown of a plastic coating onto a substrate such as in a skin package is controlled by arranging a source of radiations and a radiation sensitive means so that when the coating is in contact with the substrate the radiations from the source will be reflected from the coating into the radiation sensitive device causing drawdown to be terminated. Thus, the amount of drawdown of a plastic coating onto a substrate and around an article is controlled. The preferred apparatus for accomplishing the control includes a solid-state, light sensitive means in circuit with a semi-conductor which controls the actuation of a relay regulating the operation of a pressure differential creating device.

T904,020
RAZOR BLADE COATING

George C. Lane, Danbury, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed May 18, 1971, Ser. No. 144,506
Int. Cl. C23c *15/00*
U.S. Cl. 204—192
1 Sheet Drawing. 18 Pages Specification



The specification is directed to pseudomorphologically depositing a material on the cutting edge of a razor blade. A specific embodiment provides for sputtering chromium on the blade edge and thereafter sputtering boron nitride on the chromium coating. The sputtered boron nitride pseudomorphologically replicates the body centered cubic form of the chromium on the blade edge.

T904,021
PREPARATION OF DIOLS FROM UNSATURATED ALCOHOLS

Harry B. Copelin, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed July 26, 1971, Ser. No. 166,315
Int. Cl. C07c *31/18, 47/18*
U.S. Cl. 260—635 A
No Drawing. 9 Pages Specification

The invention relates to a process for the production of diols by the hydroformylation of unsaturated alcohols and hydrogenation of the hydroformylated product in an aqueous media. The process requires the use of phosphine complexes of rhodium to produce the desired high yields of diols. Most of the diols so produced are valuable components in the production of polyethers and polyesters.

T904,022

METHOD OF INCREASING THE SHARPNESS OF PHOTOGRAPHIC IMAGES

Richard K. Kurz, Kodak Park, Rochester, N.Y. 14650, and David V. Young, 2344 Nebraska Ave. NW., Washington, D.C. 20016

Filed Sept. 22, 1971, Ser. No. 182,881
Int. Cl. G03c 1/34
U.S. Cl. 96—109
No Drawing. 12 Pages Specification

Photographic images of improved sharpness are obtained by incorporating physical development inhibitors, e.g. mercaptotetrazoles such as phenyl mercaptotetrazole, etc. thiazoles such as mercaptothiazoles, amino mercaptothiazoles, etc., triazoles such as mercaptotriazoles, etc., in a silver halide emulsion and developing the exposed emulsion in a developing composition containing a high concentration of silver solvents, e.g. thiocyanates such as sodium thiocyanate, thiosulfates such as sodium thiosulfate, etc. The improvement in image sharpness is a result of both Edge and Eberhard effects.

T904,023

DIRECT ADDITION OF MAGNESIUM-METAL TO A TURBINE ENGINE COMBUSTION CHAMBER

James A. Kelly and George B. Cobel, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 27, 1971, Ser. No. 193,107
Int. Cl. F02c 3/20, 7/30
U.S. Cl. 60—39.02
No Drawing. 5 Pages Specification

A method to reduce or prevent the detrimental, corrosive effects attributable to gas turbine engine combustion products containing vanadium compounds. A magnesium alloy containing greater than about 80 weight percent and preferably greater than about 95 weight percent magnesium is introduced into the combustion chamber of a gas turbine engine. For optimum results, the alloy desirably is substantially free of vanadium. The metal can be in any solid form such as powder, chip, rod or wire; however, magnesium wire or rod is preferred.

The metal is fed into the combustion chamber substantially simultaneously with the turbine fuel. Generally, and preferably, the metal and fuel are fed through separate ports in the combustion chamber, but both the fuel and metal can be confluently passed into the combustion chamber at a regulated desired rate. A regulatable feed means, such as commonly used for wire in commercial welding apparatus, can be employed to insert the corrosion product inhibiting magnesium alloy into the turbine combustion chamber. The magnesium then combines with the fuel and combustion products to reduce or prevent the detrimental effects of the vanadium compounds.

T904,024

CHEMICALLY CROSS-LINKED POLYETHYLENE STABILIZED WITH SULFUR CONTAINING ALKYLESTERS OF HINDERED HYDROXYPHENYLALKANOIC ACIDS

Peter Klemchuk, Yorktown Heights, N.Y., assignor to Ciba-Geigy Corporation, Greenburgh, N.Y.

Filed Jan. 3, 1972, Ser. No. 215,113
Int. Cl. C08f 45/58; C08g 51/58
U.S. Cl. 260—45.85 B
No Drawing. 18 Pages Specification

Cross-linked polyethylene can be successfully stabilized without interfering with the cross-linking step during processing, by incorporating therein a sulfur containing alkylester of a hindered hydroxyphenylalkanoic acid, said ester being derived from a 2:1 mol ratio of said acid with a thio bis (alkanol).

These additives may be used alone or in combination with dialkylester sulfide such as distearylthiodipropionate and dilaurylthiodipropionate. Other additives, such as metal deactivators, pigments, carbon black and the like may also be present. Chemically cross-linked polyethylene is particularly useful as an insulation for high voltage power cables.

T904,025

ANTISOILING ALUMINA COATINGS FOR POROUS SURFACES

Leonard J. Schuman, Parsippany, and Raymond T. Ertle, Pompton Plains, N.J., assignors to Continental Oil Company, Ponca City, Okla.

Filed Jan. 7, 1972, Ser. No. 216,267
Int. Cl. B32b 27/06; B44d 5/00
U.S. Cl. 117—138.8 UA
No Drawing. 5 Pages Specification

A method for applying an antisoiling alumina coating to porous surfaces by applying a mixture containing from about 6 to about 9 weight percent dispersible alumina; from about 0.6 to about 1.0 weight percent acid selected from monofunctional organic acids containing from 1 to about 4 carbon atoms, halogenated monofunctional organic acids containing from about 2 to about 4 carbon atoms and mineral acids; about 18 to about 25 weight percent non-dispersible alumina and about 75.4 to about 65 weight percent water to provide an antisoiling coating. A preferred acid is monochloroacetic acid and a preferred mixture contains from about 7 to 8 weight percent dispersible alumina, about 0.7 to about 0.9 weight percent monochloroacetic acid, about 20 to about 23 weight percent non-dispersible alumina and about 72.2 to about 69 weight percent water. In an example a mixture of 7.7 weight percent "Dispal" dispersible alumina, 0.7 weight percent monochloroacetic acid, 23.0 weight percent "Conopal" non-dispersible alumina and 68.6 weight percent water was used to apply an alumina coating to acrylic foam-backed material.

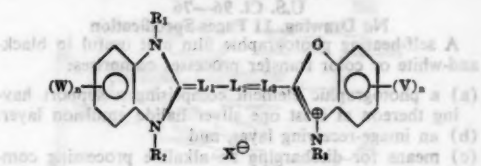
T904,026

SENSITIZING DYE COMBINATIONS CONTAINING BENZIMIDAZOLOBENZOXAZOLOCARBOCYANINE DYES

Mary Jane W. Brizee, Pittsford, N.Y. (Kodak Park, Rochester, N.Y. 14650)

Filed Jan. 24, 1972, Ser. No. 220,417
Int. Cl. G03c 1/18
U.S. Cl. 96—124
No Drawing. 37 Pages Specification

Photographic silver halide emulsions are spectrally sensitized with a dye combination comprising (1) a benzimidazolobenzoxazolcarbocyanine dye, and (2) a sensitizing dye selected from the group consisting of (a) a hemicyanine dye, (b) a merocyanine dye, (c) a complex cyanine dye containing a 5-membered ketomethylene heterocyclic nucleus containing nitrogen as the first heteroatom and nitrogen or sulfur as the second heteroatom, (d) a dicarbocyanine dye, (e) a tricarbocyanine dye, (f) a hemioxonol dye, and (g) a complex merocyanine dye. In preferred dye combinations the benzimidazolobenzoxazolocarbocyanine dye has the following formula:

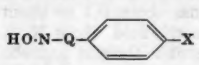


wherein each *n* represents 1 or 2; R_1 represents an unsubstituted lower alkyl group: R_2 and R_3 each represents an alkyl group, an alkenyl group or an aryl group; X represents an acid anion; W represents halogen, an alkylcarbamoyl group, an acyl group, an aryl group, an

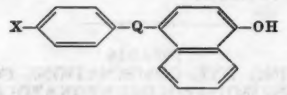
alkyl group, an alkoxy group, cyano, a haloalkyl group or a haloalkylsulfonyl group; and V represents an alkoxy group, an alkyl group or an aryl group, L_1, L_2, and L_3 represent a methine linkage. Typical highly useful emulsions comprise silver bromoiodide emulsions containing a combination of a benzimidazolobenzoxazolocarbocyanine dye such as anhydro-1-allyl-5-chloro-3'-ethyl-5'-methoxy-3-(3 - sulfopropyl)-benzimidazoloxacarbocyanine hydroxide or anhydro-5,6-dichloro-1,3'-diethyl-5'-methoxy - 3 - (3-sulfopropyl)benzimidazoloxacarbocyanine hydroxide, and one of the dyes (a) through (g) above.

T904,027
AROMATIC POLYMERS
Terence Edwin Attwood, Kimpton, John Brewster Rose, Letchworth, and Alan Francis Lennox, Welwyn Garden City, England, assignors to Imperial Chemical Industries Limited, London, England
Filed Feb. 1, 1972, Ser. No. 222,698
Claims priority, application Great Britain, Feb. 4, 1971, 3,937/71
Int. Cl. C08g *23/00, 23/16*
U.S. Cl. 260—49
No Drawing. 8 Pages Specification

Aromatic polymers containing repeating units of monomers of naphthalene residues of the type:



where N is a naphthalene group linked to the monomer chain in two ring positions, X is halogen, preferably fluorine or chlorine, and Q is $—SO_2—$ or —CO— and novel halophenyls of the formula:



where X and Q are defined as above, are polymerized. The above monomers may be polymerized separately or copolymerized together, particularly when Q is $—SO_2—$, to form useful thermoplastic objects including moldings, fibers and films as well as surface coatings and adhesives. Polymerization is preferably accomplished using at least one of the above halophenyl compounds in the form of an alkali metal salt or by reaction of the halophenol compound in the presence of an alkali metal fluoride.

T904,028
SELF-HEATING DIFFUSION TRANSFER FILM UNIT
Frederick E. Ford and Hugh S. A. Gilmour, both of Kodak Park Works, Rochester, N.Y. 14650
Filed Feb. 4, 1972, Ser. No. 223,774
Int. Cl. G03c *1/48*
U.S. Cl. 96—76
No Drawing. 11 Pages Specification

A self-heating photographic film unit useful in black-and-white or color transfer processes comprises:

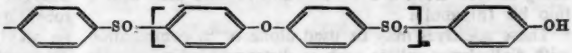
(a) a photographic element comprising a support having thereon at least one silver halide emulsion layer,
(b) an image-receiving layer, and
(c) means for discharging an alkaline processing composition within the film unit, such as a rupturable container, the film unit containing a silver halide developing agent and a heat-generating means for raising the temperature of the film unit during processing from about 10–30° F. over the ambient atmospheric temperature.

Heat-generating means disclosed include acid-base and oxidation-reduction materials which produce heat upon reaction. Specific acidic materials disclosed include polymeric acids such as a copolymer of maleic anhydride and methyl vinyl ether. Specific alkaline materials disclosed include sodium and potassium hydroxide. Oxidation-reduction materials disclosed include thioureahydrogen peroxide. One component of the exothermic pair can be incorporated in the processing composition while the other is incorporated in the photosensitive element or image-receiving layer. The heat-generating materials may also be incorporated in two rupturable containers or one container with two compartments. Since the heat-generating means is in the photographic film unit itself, it is generally more efficient than supplying heat to the film unit by external means.

T904,029
COPOLYMERS
Stuart Gaskin, Hatfield, and Eric Nield, Watton-on-Stone, England, assignors to Imperial Chemical Industries Limited, London, England
Filed Feb. 22, 1972, Ser. No. 228,261
Claims priority, application Great Britain, Mar. 4, 1971, 6,027/71
Int. Cl. C08g *41/04*
U.S. Cl. 260—857 TW
No Drawing. 38 Pages Specification

Block copolymers having from 1 to 99% of units of a high modulus aromatic polymer such as aromatic polyamides and aromatic polyesters and 99 to 1% of units derived from a thermoplastic condensation polymer compatible with the block copolymer and having a group capable of condensation with a monomer of the high modulus polymer are disclosed. Suitable high modulus polymers may be obtained by polymerizing an amino or hydroxy-carboxylic acid or polymerizing substantially equimolar proportions of an aromatic diamine or diol with an aromatic dicarboxylic acid. Preferably the high modulus polymer contains units derived from 1,4-diaminobenzene or terephthalic acid. Thermoplastic condensation polymers of the type described include polysulphones, polyketones, aliphatic polyamides for example nylons, polyesters for example polyethylene terephthalate, polyolefins and aromatic polycarbonates, provided that the polymer is thermoplastic. Copolymers of the present invention exhibit increased modulus and impact strength by providing a block copolymer having units of a reinforcing material, an aromatic polyamide or aromatic polyester, and units of the thermoplastic condensation polymer to be reinforced. The copolymers are useful for forming filaments and shaped articles.

Also disclosed are methods to produce the block copolymers as characterized above and include reaction of the aromatic polyamide or polyester with the thermoplastic condensation polymer in the presence of a solvent and an acid acceptor. Another method disclosed reacts a polyamide, polysulphone or lactam with an aromatic sulphone in the presence of an alkaline catalyst. Illustrative of the method is the reaction of caprolactam with an aromatic polysulphone in the presence of sodium hydride to produce a chain of caprolactam units and pendant branches grafted thereto comprising units of the formula

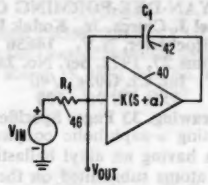


m being approximately 1 to 5.

T904,030
UNIQUE CLASS OF TWO-POLE ACTIVE FILTERS

Neil R. Davie, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 27, 1972, Ser. No. 238,309
Int. Cl. H03h 7/10
U.S. Cl. 307—295
2 Sheets Drawing. 13 Pages Specification



A new class of two-pole active low-pass filters is disclosed herein. The frequency dependent amplifier in the filter has a transfer characteristic in the frequency domain which takes the form $-K(s+\alpha)$. When this frequency dependent amplifier is used with capacitive feedback, the transfer function of the total filter is given by the expression

$$T(s)=\frac{1}{s^2+\frac{K\alpha+1}{K}s+\frac{1}{KR_1C_1}}$$

In this expression, R_1 is the resistance **46** in the input leg to the filter and C_1 is the feedback capacitance **42** around the frequency dependent amplifier **40**. The values of K and α will vary depending upon the configuration of the frequency dependent amplifier **40** and the choice of components.

One of the simplest and most effective implementations of the frequency dependent amplifier **40** is the use of a single transistor **52** with a parallel RC network R_3C_3 connected to the emitter, a load resistor R_2 connected to the collector, and the input node of the amplifier connected to the base. The capacitive feedback is connected between the collector and base of the transistor. Other possible implementations include frequency dependent amplifiers which have internal feedback loops. The reactive elements used to obtain the frequency dependent characteristic for the amplifier may be placed either in the internal feedback loop of the amplifier or external to the internal feedback loop of the amplifier.

T904,031
AMMONIUM POLYPHOSPHATES

John F. McCullough, 105 Terrace, Florence, Ala. 35630, and Richard C. Sheridan, 2909 Alexander, Sheffield, Ala. 35660

Filed Mar. 27, 1972, Ser. No. 238,604
Int. Cl. C01b 15/16, 25/26
U.S. Cl. 423—305
No Drawing. 19 Pages Specification

A method for producing long-chain crystalline ammonium polyphosphates with the general formula

$$(NH_4)_mH_{(n-m)+2}P_nO_{3n+1}$$

where n is greater than about 50 and where the ratio m/n is in the range 1.04 to about 0.85 by thermal condensation of ammonium ortho-, pyro-, tripoly-, tetrameta-, or oligophosphates by heating in a stream of ammonia at temperatures of about 200° C. to about 400° C. for a period of about 1 to 16 hours.

Any of three crystalline modifications were prepared by suitable control of the operating conditions. Both ammoniated wet-process and furnace-grade phosphoric acid were used as feed materials, and the products were high-analysis fertilizers with $N\text{-}P_2O_5\text{-}K_2O$ grades ranging from 13–67–0 to 14–73–0.

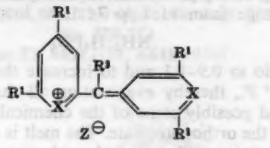
T904,032
SENSITIZING DYES FOR ELECTROPHOTOGRAPHIC COMPOSITION AND ELEMENT

George A. Reynolds and James A. Van Allan, both % Eastman Kodak Co., Kodak Park Division, 1999 Lake Ave., and Lawrence E. Contois, % Eastman Kodak Co., Kodak Park Division, 1669 Lake Ave., all of Rochester, N.Y. 14650

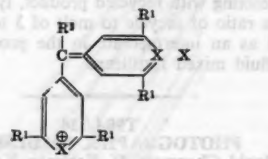
Filed Mar. 17, 1972, Ser. No. 235,845
Int. Cl. G03g 5/06
U.S. Cl. 96—1.6
No Drawing. 24 Pages Specification

This invention relates to organic compounds useful as sensitizers for organic photoconductive compositions having one of the following formulas:

I.



II.



wherein:

R^1 represents a hydrogen atom, an alkyl radical having 1 to about 15 carbon atoms, a substituted alkyl radical wherein the alkyl moiety contains from 1 to about 15 carbon atoms and wherein the substituents are phenyl radicals or alkoxy radicals containing 1 to about 4 carbon atoms, a phenyl radical, and a substituted phenyl radical having as substituents alkyl radicals having 1 to about 15 carbon atoms or alkoxy radicals having 1 to about 4 carbon atoms;

R^2 represents R^1 and a radical having the following formula:

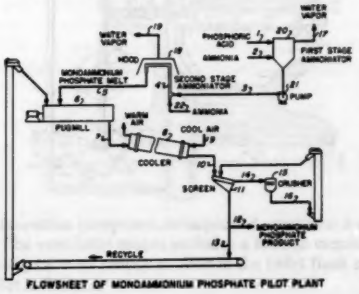
X represents a hetero atom selected from the group consisting of an oxygen and a sulfur atom; and

$Z^\ominus$ is an anionic function.

T904,033
MONOAMMONIUM PHOSPHATE PRODUCTION

Robert G. Lee, Lakeside Acres, Florence, Ala. 35630, and Melvin M. Norton, Rte. 1, Virginia Shores, Sheffield, Ala. 35660

Filed May 26, 1972, Ser. No. 257,153
Int. Cl. C05b 7/00
U.S. Cl. 71—34
1 Sheet Drawing. 11 Pages Specification



FLOWSHEET OF MONOAMMONIUM PHOSPHATE PILOT PLANT

Process for the production of monoammonium phosphate in finely divided granular form containing up to 30 percent of its P_2O_5 as polyphosphate. Orthophosphoric acid typically containing 54 percent P_2O_5 is ammoniated in two stages utilizing heat from the reaction to evaporate water and produce essentially anhydrous, molten monoammonium phosphate. The specific procedure followed is a spin-off of Getsinger's teachings in U.S. Pat. 3,382,059. Gaseous ammonia is fed to the first stage at a rate to give 2–6 percent by weight nitrogen in the acid, resulting in temperatures of 220–285° F. and evaporation of up to half of the free water from the acid. The remainder of the ammonia is added to the second stage, consisting of a pipe reactor with length to diameter ratio in the range from 11:1 to 74:1, to increase the

$$NH_3:H_3PO_4$$

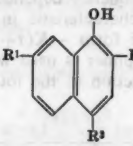
mole ratio to 0.9–1.1 and to increase the temperature to 350–440° F., thereby evaporating all the remaining free water and possibly some of the chemically combined water from the orthophosphate. The melt is cooled and solidified by mixing with recycled product, typically in a pugmill, at a ratio of recycle to melt of 3 to 1. The product is useful as an intermediate in the production of granular or fluid mixed fertilizers.

T904,034
PHOTOGRAPHIC EMULSIONS
Derek David Chapman, % Eastman Kodak Co., Kodak Park Division, 1999 Lake Ave., Rochester, N.Y. 14650
Filed June 26, 1972, Ser. No. 266,190
Int. Cl. G03c *1/16, 1/36*
U.S. Cl. 96—100
No Drawing. 33 Pages Specification

Silver halide emulsions are provided, which feature certain cyanine and merocyanine dyes containing a 3 or 5 position pyrazole nucleus. The dyes are outstanding electron acceptors and spectral sensitizers in direct positive type photographic silver halide emulsions. They provide superior reversal systems, especially with fogged silver halide emulsions that are characterized by good speed with maximum sensitivity occurring in the region of from about 440 to 580 nm.

T904,035
NOVEL CYAN-DYE-FORMING COUPLER
Samuel J. Ciurca, Jr., Kodak Park, Rochester, N.Y. 14650
Filed June 27, 1972, Ser. No. 266,766
Int. Cl. G03c *1/40*
U.S. Cl. 96—100
No Drawing. 33 Pages Specification

Cyan-dye-forming α-naphtholic couplers and intermediate compounds having an alkyl ballasting group of 12 or more carbon atoms substituted on the No. 7 ring position of the B ring as in the formula



wherein

R^1 is an alkyl group;

R^2 is a hydrogen atom, an amino group, an alkyl carbamyl group, an arylcarbamyl group, or a carbamyl group;

R^3 is a hydrogen atom, an amino group, or a coupling off group including an aryl azo and a sulfonamido group; also elements and emulsions containing one or more of the above defined couplers and a method for improving color photographic images by utilizing said couplers.

PATENTS

GRANTED NOVEMBER 21, 1972

GENERAL AND MECHANICAL

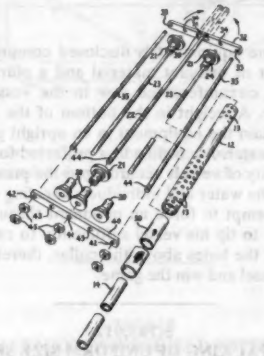
3,703,007
FINGER RING DISPLAY GLOVE
Gloria Stewart, 1140 Central, Downers Grove, Ill.
Filed March 15, 1971, Ser. No. 124,118
Int. Cl. A41d *19/00*
U.S. Cl. 2—163 **2 Claims**

The back of the glove is made in part of an elasticized material or stretch type knitted material which extends forwardly from above the narrowest portion of the glove and comprises the backs of the finger portions beyond the knuckle to the first joint to facilitate donning the glove. The thumb stall may also be made of the same material. At least one of the finger backs, usually the ring finger, and/or the thumb stall is slit to permit a large stone or decoration of a ring worn on the finger or thumb to project outwardly of the glove so as to be seen. When no ring or one without a projecting stone is worn the slit is closed by overlapping pieces of material which adheres to itself. These pieces are secured to the inner faces of the elasticized or similar material of the glove and finger portions.

3,703,008
WAISTBAND CONSTRUCTION
Arthur Franklin Hudson, P.O. Box 1025, Huntington, Ind.
Filed Dec. 30, 1970, Ser. No. 102,702
Int. Cl. A41d *1/06*
U.S. Cl. 2—237 **9 Claims**

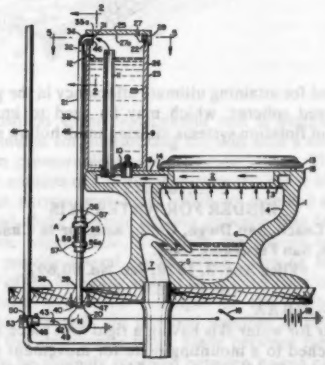
A frusto-conically shaped panel of elastomeric two-way stretch material is secured at the lower edge within the interior of a pair of trousers along the waistline and the upper edge of the band is supported by collapsible panels. When the trousers are worn, the waistband is stretched to conform with the waistline of the wearer, and the stretched waistband provides a reinforcement to the upper edge of the trousers, preventing them from turning over or deforming under use.

3,703,009
CLOTH REINFORCING MEMBER FOR USE IN MAKING TISSUE GRAFTS
Charles H. Sparks, 3725 S.E. Martins Street, Portland, Oreg.
Division of Ser. No. 823,287, May 9, 1969, Pat. No. 3,625,198, which is a continuation-in-part of Ser. No. 655,838, July 25, 1967, Pat. No. 3,514,791. This application Sept. 7, 1971, Ser. No. 178,171
Int. Cl. A61f *1/24*; A61b *19/00*
U.S. Cl. 3—1 **2 Claims**



Method and apparatus for growing a graft structure, particularly in a patient's own body. A die cluster is disclosed comprising a plurality of dies for growing graft tubes whereby such graft tubes may be connected together end to end to make a tube of desired length. The invention further includes an improved method for implanting the die cluster in the body, an improved cloth reinforcing member for tissue grafts and method of preparing same.

3,703,010
VENTILATED TOILET
Dale F. Russell, 6195 Rochester Road, Troy, Mich.
Filed May 12, 1970, Ser. No. 36,563
Int. Cl. E03d *9/05*
U.S. Cl. 4—216 **4 Claims**

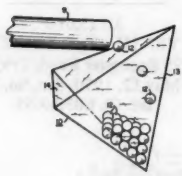


My invention comprises an improved ventilator means for a toilet. The ventilator means includes a suction means having a regulating valve to reduce suction in the toilet flush tank when the toilet is flushed.

3,703,011
AQUATIC GAME AND EQUIPMENT THEREFOR
Charles P. Goggi, 140 Cebra Avenue, Stapleton, and Eugene S. Goggi, 5 Liberty Avenue, Dongan Hills, both of N.Y.
Filed Dec. 7, 1970, Ser. No. 95,509
Int. Cl. B63c ; B63b *35/00*
U.S. Cl. 9—1 A **12 Claims**

Aquatic game equipment is disclosed comprising a vessel having a collar of buoyant material and a plurality of holes disposed in a circumferential row in the vessel above the buoyant collar. A weight in the bottom of the vessel is provided to maintain the equipment in an upright position when placed in the water. According to a preferred form of aquatic game, a plurality of vessels according to the present invention are placed in the water and individuals kneeling or standing in the vessels attempt to force an opponent through the use of jousting sticks to tip his vessel sufficiently to cause it to ship water through the holes above the collar, thereby to sink the opponent's vessel and win the game.

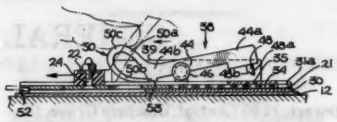
3,703,012
CLOSE PACKING OF UNIFORM SIZE SPHERES
Phillip W. Mast, Raleigh, N.C., and Laurent A. Beaubien, Arlington, Va., assignors to The United States of America as represented by the Secretary of the Navy
Filed Dec. 12, 1969, Ser. No. 884,526
Int. Cl. B63b *21/00*
U.S. Cl. 9—8 **3 Claims**



A method for attaining ultimate effeciency in the packing of uniform-sized spheres; which may be used to improve the buoyancy of flotation systems utilizing small hollow spheres.

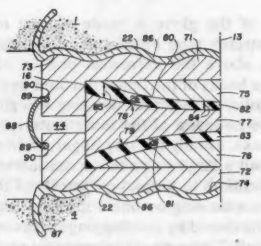
3,703,013
BINDER FOR WATER SKIS
George J. Leach, San Diego, Calif., assignor to Chartered Enterprises, San Fernando, Calif.
Filed Aug. 3, 1970, Ser. No. 60,692
Int. Cl. A63c *15/06*
U.S. Cl. 9—310 AA **4 Claims**

A binder for water skis having a rigid foot piece and a heel piece attached to a mounting plate for movement relative to the foot piece. Guides are located at opposite sides of the heel piece and have tracks for receiving the edges of the mounting plate. A latch means is provided to normally hold the heel piece from movement away from the foot piece while permitting movement of the heel piece towards the foot piece. The latch means comprises a pivotally mounted arm having a tapered latch pin normally located in a hole in one of the guide means and in one of a plurality of adjacent holes along a side



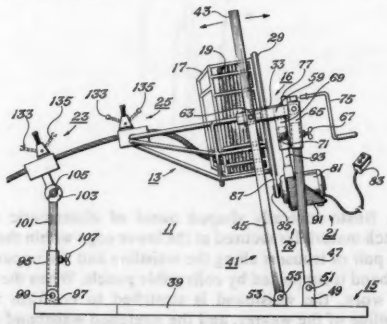
edge of the mounting plate of the heel piece. The taper on the pin permits the latch pin to ratchet and allow the heel piece to move towards the foot piece.

3,703,014
TILTABLE BEARING MEANS, ESPECIALLY FOR BRIDGES
Waldemar Koester, Forsbach, Germany, assignor to Firma Kober AG, Glarus, Switzerland
Filed Feb. 2, 1971, Ser. No. 111,854
Int. Cl. E01d *19/06*
U.S. Cl. 14—16 **22 Claims**



This invention relates to bearing means, especially for heavy loads such as bridges. A piston means on which the load bears is held in a cylinder which is also filled with pressure material. The surface of the piston which faces the pressure material has such a shape that the piston height, relative to a central axis, increases from said axis toward the periphery of the piston whereby such pressure material facing surface of the piston may, for example, have a concave shape, a stair-step shape, a hollow cone shape, or any other shape providing the smallest piston height at the location of said axis and a larger piston height at the piston periphery.

3,703,015
CONDUIT CLEANING APPARATUS
Lester H. Naeve, 3504 Parker Road, Fort Worth, Tex.
Filed Aug. 25, 1971, Ser. No. 174,812
Int. Cl. B08b *9/02*
U.S. Cl. 15—104.3 SN **11 Claims**



Conduit cleaning apparatus characterized by a cage containing a demountable reel of cable; a support frame compris-

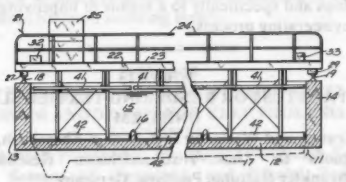
ing a base member; a support means carried by the base member for effecting reciprocal movement of the cage; first and second ratchet gripping means for either advancing the cable from the reel into the conduit to be cleaned or from the conduit and into the reel when the cage is moved reciprocally via the support means. The cage may be rotated by either manual or power drive means. The apparatus is designed to be broken down into four subassemblies so that one worker may easily transport, assemble, use and disassemble the apparatus without requiring a helper. Also disclosed are specific structural features that are employed in preferred embodiments.

3,703,016

TRAVERSING BRIDGE FRICTION DRIVE ALIGNMENT CONTROL

Lester H. Schramm; John B. Rank, both of Milwaukee, and Melvin R. Salkeld, Brookfield, all of Wis., assignors to Rex Chainbelt Inc., Milwaukee, Wis.

Filed Oct. 19, 1970, Ser. No. 81,718
Int. Cl. B61d *15/00;* **B66c** *17/26;* **F22b** *37/48*
U.S. Cl. 15—246.5 **7 Claims**



Four wheels support a travelling bridge on parallel rails. One wheel at each end is driven by a motor and the power supply driving each motor is separately adjustable. The other two wheels are cylindrical and of the same nominal size and are journalled so that they roll freely in supporting the bridge on the rails.

Relative rotation of the two cylindrical wheels indicating bridge misalignment adjusts the two power supplies to correct such misalignment. If the misalignment of skewing is due to an off-centered load encountered by the bridge, the corresponding adjustments of the torque outputs of the motors compensate for such a load. If the overload is too great, the increased skew angle will then reach the limits which shut off the power supply.

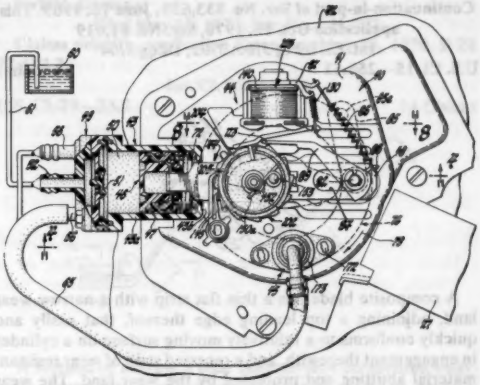
3,703,017

ALTERNATING SQUIRT WINDSHIELD WASHER

Ralph W. Edwards, Bellbrook, and Ronald G. Petry, Xenia, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 7, 1970, Ser. No. 95,825
Int. Cl. B60s *1/48*
U.S. Cl. 15—250.02 **2 Claims**

In a preferred form, this disclosure relates to a windshield cleaning apparatus for cleaning a windshield of an automotive vehicle. The windshield cleaning apparatus comprises a wiper unit having first and second oscillatable windshield wipers which are movable in opposite directions through inboard and outboard strokes during each cycle of operation and a washer unit having a pump and a diverter valve means actuated in timed relationship with the wiper unit to effect alternate squirting of all of the washer fluid being delivered by the pump in the path of movement of the first wiper as the latter is moved through its inboard stroke and to squirt all of the washer fluid being delivered by the pump in the path of movement of the second wiper as the latter is being moved through its outboard stroke during each cycle of operation of the wipers.

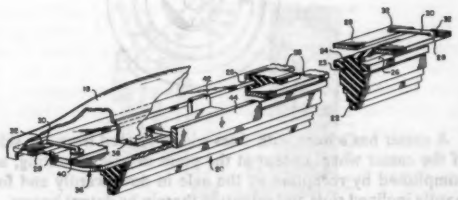


3,703,018

REPLACEMENT WINDSHIELD WIPER UNIT

Lazar I. Seiler, and James P. Nicholas, both of Norwalk, Conn., assignors to Yankee Metal Products Corporation, Norwalk, Conn.

Filed Aug. 4, 1971, Ser. No. 168,959
Int. Cl. B60s *1/02*
U.S. Cl. 15—250.42 **9 Claims**

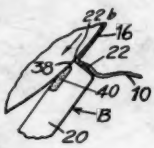


A windshield wiper replacement unit is disclosed, incorporating means for interlocking the unit with a conventional wiper arm pressure-distributing bow or bridge. The replacement unit consists of a resilient elastomeric wiper blade, and a pair of flat, narrow, metal rails which are received edgewise in and extend along grooves let into opposite side faces of the elastomeric wiper blade, straddling the wiping edge of the blade to provide lateral rigidity while allowing longitudinal flexibility of the assembly so that the wiping edge of the blade can conform to contour changes in the surface of the windshield. The rails are fastened together at their ends to sandwich the elastomeric wiper blade between them and are adapted to be slidingly received between paired claws at opposite ends of the pressure-distributing wiper arm bow. One of the rails is provided with a pivotable latch lever positionable to trap a claw of the bow structure and thereby restrict sliding movement of the replacement wiper unit relative to the bow.

3,703,019
SURFACE CONFORMING WEAR RESISTANT DOCTOR BLADE FOR ROLLS

Richard L. Bratt, Holden, Mass., assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 833,659, June 16, 1969. This application Oct. 15, 1970, Ser. No. 81,019
Int. Cl. D21g 3/00, 3/02; D2qg 3/04
U.S. Cl. 15—256.51 14 Claims

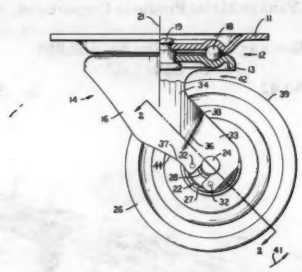


A composite blade has a thin flat strip with a narrow wear land, adjoining a top leading edge thereof, that easily and quickly conforms to a relatively moving surface on a cylinder in engagement therewith, and a recessed strip of wear resistant material abutting and protected by the wear land. The wear resistant strip upon contacting the moving surface reduces and controls any further wearing of the wear land to a rate compatible thereto and thereby extends the useful life of the blade.

3,703,020
ANTI-FOULING CASTER, SWIVEL-TYPE

John A. Skupas, and Robert H. Godwin, both of Evansville, Ind., assignors to Bliss & Laughlin Industries, Incorporated, Oak Brook, Ill.

Filed July 10, 1969, Ser. No. 840,742
Int. Cl. B60b 33/00
U.S. Cl. 16—31 10 Claims

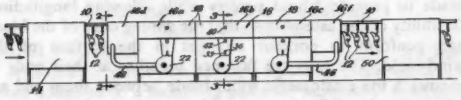


A caster has a horn with sides widely spaced from the sides of the caster wheel except at the point of axle mounting, accomplished by reception of the axle in downwardly and forwardly inclined slots and retention therein by detent bosses.

3,703,021
POULTRY PROCESSING METHOD AND APPARATUS

Allen W. Sharp, 1540 North Van Buren Street, Ottumwa, Iowa

Filed Dec. 28, 1970, Ser. No. 101,907
Int. Cl. A22c 21/02
U.S. Cl. 17—47 6 Claims

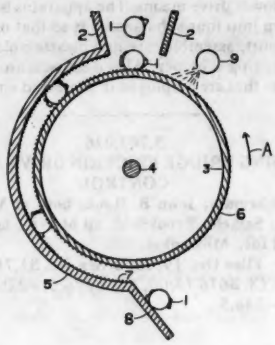


Method and apparatus for scalding fowls in a sanitary manner so that scald water utilized in the scalding of the body of one fowl is not reused in the scalding of the bodies of other fowls.

3,703,022
SCALLOP MUSCLE AND VISCERA PRECONDITIONER

Charles Milton Bunnell, P.O. Box 1695, St. Augustine, Fla.

Filed March 17, 1971, Ser. No. 125,120
Int. Cl. A22c 29/00
U.S. Cl. 17—53 2 Claims

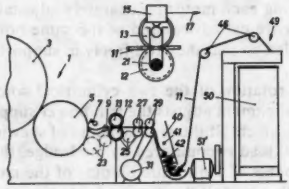


This invention relates generally to the machine-processing of scallops and specifically to a means of improving efficiency in the eviscerating process.

3,703,023
APPARATUS FOR RENDERING TEXTILE SLIVERS UNIFORM

Paul Krauss, and Wolfgang Igel, both of Ebersbach, Germany, assignors to Zinser-Textilmaschinen Gesellschaft mit beschrankter Haftung, Postfach, Germany

Filed Sept. 30, 1970, Ser. No. 76,707
Int. Cl. D01h 5/38
U.S. Cl. 19—240 8 Claims



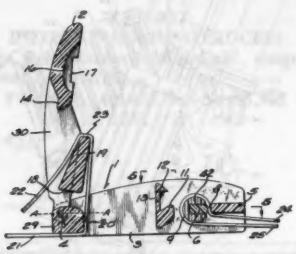
Textile apparatus for reducing the unevenness in textile slivers. A card feeds sliver to a sensing device which detects any thickness variations and, through a draft control device, controls a variable speed motor which drives one of two pairs of drafting rollers, the other pair of which is driven at a substantially constant rate, the difference in speed between the pairs serving to draft the silver and also reduce the unevenness. An intermediate sliver storage device is located either (1) between the drafting rolls and the sliver coiler means which feeds the sliver into a can, or (2) between the card and the sliver sensing device. Photoelectric detecting means monitors the level of the sliver in the storage device and controls a second variable speed motor which, in the first modification drives the sliver coiler means, and in the second modification drives the card to maintain substantially constant the sliver level in the storage device. Either pair of drafting rolls may be variably driven, and each pair is provided with a tacho-generator to monitor its speed, the two tacho-generators operating in the event of any variation in the speed of the normally constant speed rolls to further vary, through the draft control device, the speed of the variable speed rolls to compensate for any erratic variation in the constant speed rolls. The second variable speed motor is controlled by varying the field current which effects a more gradual speed change and is advisable because of the high inertia of the card and the sliver coiler means.

3,703,024

BUCKLE

Edwin L. Johnson, 5808 Eastwood Lane, Grafton, Wis.

Filed Nov. 23, 1971, Ser. No. 201,406
Int. Cl. A44b *21/00, 11/06*
U.S. Cl. 24—68 CD 5 Claims



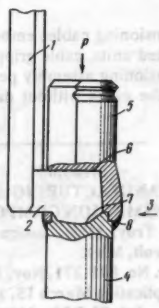
A buckle construction which adapts to use in cargo and vehicular tie-down apparatus wherein a secure and positive control is required and when operation of the tie-down permits relatively simple tightening and untightening of the strap apparatus used for such securing means.

3,703,025

METHOD OF MAKING A COMPOSITE STEEL-ALUMINUM ANODE ROD FOR ELECTROLYSIS OF ALUMINUM

Aron Markovich Povolotsky; Vyacheslav Petrovich Sushkin; Anatoly Semenovich Fateichev, and Nikolai Vasilievich Gavrilov, all of Leningrad, U.S.S.R., assignors to Leningradskoe Proektno-Experimetalnoe Otdelenie Vsesojuz-Nogo Gosudarstvennogo Nauchno Issledovatelskogo I Proekt-Nogo Instituta Vniiproektelektromontash, Leningrad, U.S.S.R.

Filed April 6, 1971, Ser. No. 131,670
Int. Cl. B23p *11/02*
U.S. Cl. 29—446 1 Claim



The disclosure relates to a composite steel-aluminum anode rod comprising an aluminum bar having a tail portion extending aside therefrom and a steel rod consisting of two portions. One portion of the steel rod has a socket, in which there is rigidly fixed the tail portion of the aluminum bar in the process of welding both portuons of the steel rod. The second portion of the steel rod is butt-welded to the tail portion of the aluminum bar.

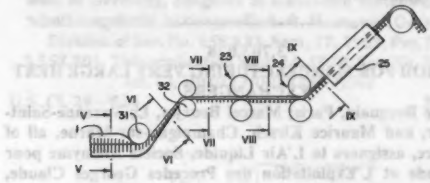
A method of making a composite steel-aluminum anode rod, providing for butt welding of one of the portions of the steel rod to the tail portion of the aluminum bar, after which operation the tail portion of the aluminum bar is put into the socket in the second portion of the steel rod. Then the steel rod is squeezed and both portions thereof are welded in a prestressed state for rigidly fixing the prestressed state of the weld joint between the steel rod and the aluminum bar.

3,703,026

APPARATUS FOR MANUFACTURING A SLIDE FASTENER

Wilhelm Uhrig, Mannesmannstrasse 11, 56 Wuppertal-Elberfeld, Germany

Filed May 10, 1971, Ser. No. 141,707
Claims priority, application Germany, May 13, 1970, P 20 23 412.2
Int. Cl. B29d *5/00*
U.S. Cl. 29—33.2 14 Claims



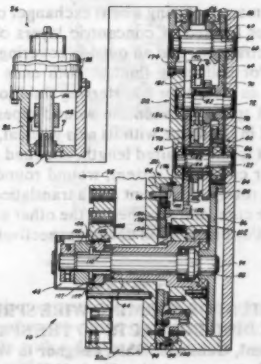
A method of making a slide fastener unit comprising weaving a thermoplastic monofilament through the flank portions of each of two Y-tapes, the monofilament of each tape being looped back and forth through the flanks so that the vertical sections between the flanks of one tape are in staggered or alternating relation to those of the other tape, whereafter these vertical sections are folded, embossed in the middle sections, pre-curved on the side sections and molded to fix the shape with the two tapes in fastened position. A novel folding, embossing, pre-curving, molding and ironing apparatus is also disclosed for the continuous manufacture of the slide fastener separately or in conjunction with a conventional weaving loom.

3,703,027

TURRET INDEXING ASSEMBLY

Arthur H. Geyler, Cincinnati, Ohio, assignor to The G. A. Gray Company, Cincinnati, Ohio

Filed April 1, 1971, Ser. No. 130,301
Int. Cl. B23b *29/32, 3/20*
U.S. Cl. 29—39 11 Claims



An improved machine tool includes a rotatable turret which is indexed to move a selected one of a plurality of tools into a working relationship with a workpiece which is held by a rotatable table or spindle. A releasable coupling holds the turret against rotation relative to the workpiece during machine operations. When the turret is to be indexed, the coupling is released and a pair of intermittent gears in an indexing assembly are moved into a driving relationship to effect rotation of the turret. As the turret is indexed to a new position, the intermittent gears are moved out of the driving relationship and

into a positioning relationship with each other to interrupt rotation of the turret. To prevent unnecessary loading on the intermittent gears, a holding mechanism retains the turret against rotation during the initial and final portions of an indexing cycle independently of the intermittent gears. This holding mechanism includes an escapement wheel which is engaged by a roller carrier during initial and final portions of the indexing cycle to retain the turret against rotation while the coupling is being disengaged and re-engaged and the intermittent gears are being moved between the driving and positioning relationships.

3,703,028

METHOD FOR MANUFACTURING VERY LARGE HEAT EXCHANGERS

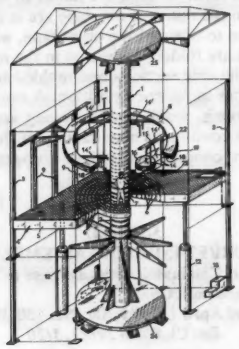
Maurice Bosquain, Paris; Marcel Bourjot, La Varenne-Saint-Maur, and Maurice Kirsch, Champigny-sur-Marne, all of France, assignors to L'Air Liquide, Societe Anonyme pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France

Filed July 28, 1970, Ser. No. 58,779

Claims priority, application France, Nov. 13, 1969, 6938976

Int. Cl. B21d *53/02*; B23p *15/26*

U.S. Cl. 29—157.3 R **3 Claims**



Process for manufacturing a heat exchanger of the type with a nest of tubes formed of concentric layers of wound pipes between a central core and an outside covering, means of distributing and/or collecting fluid at both ends of the nest of tubes, as well as means for transferring fluid longitudinally in the interstitial space between the wound pipes, in which the core is placed in the space with its axis vertical, and the pipes, previously out to the required length, attached at one end in a distribution or collection system, wound round the said core by means of a rotary movement and a translation movement in relation to the core, and attached at the other end to the other collection and/or distribution device respectively.

3,703,029

APPARATUS FOR FORMING WIRE SPRINGS AND WELDING CONTACTS TO THE SPRINGS

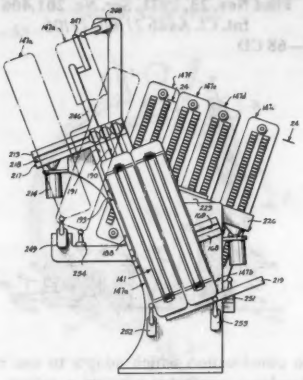
William C. Kent, Gahanna, Ohio, assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Jan. 30, 1970, Ser. No. 7,029

Int. Cl. B23p *19/04*

U.S. Cl. 29—208 D **16 Claims**

Certain types of wire spring assemblies include a plurality of parallel, spaced wires extending from opposite sides of a block formed of an insulating material. A plurality of the wire spring assemblies are loaded into a rack and the rack is attached to a dispensing mechanism for feeding serially successive wire block assemblies from the rack. Adjacent pairs of the wire springs extending from one side of the block are twisted together and coined. The opposite ends of the wire springs are coined and have contacts welded thereto. Portions of the wire springs extending from both sides of the wire block are formed at offset angles and are thereafter loaded into another rack



which is attached to an unloading mechanism so that the completed wire spring assemblies may be transferred to a subsequent assembly station and used in the formation of a switching assembly.

3,703,030

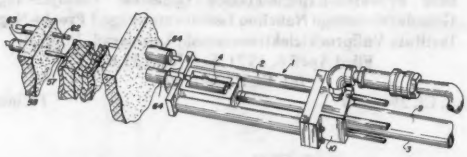
IMPROVEMENTS IN TENSIONING DEVICES

James S. Simms, 5301 W. Patterson, Chicago, Ill.

Filed Sept. 26, 1969, Ser. No. 861,364

Int. Cl. B23p *19/04*

U.S. Cl. 29—252 **16 Claims**



Apparatus for tensioning cables embedded in concrete, including fluid actuated units, cable gripping members, jacking means and a de-tensioning assembly permitting to cut off the excess portion of the cable without danger to personel and equipment.

3,703,031

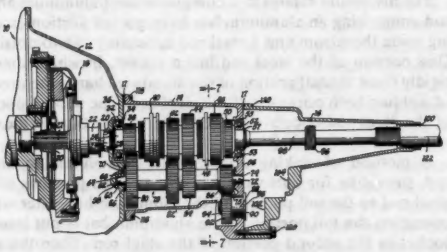
METHOD OF MANUFACTURING AND ASSEMBLING TRANSMISSION COMPONENTS

James W. Fodrea, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 875,271, Nov. 10, 1969, Pat. No. 3,645,147. This application March 15, 1971, Ser. No. 124,394

Int. Cl. B23p *21/00*

U.S. Cl. 29—469 **6 Claims**



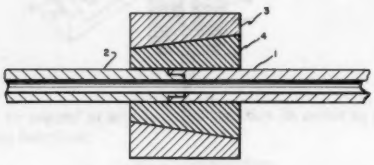
A transmission including a die cast transmission housing which is readily convertible for use with three-, four-, or five-

speed, sliding gear, fully synchronized transmission assemblies, which assemblies may be accomplished on the motor vehicle, thereby eliminating the need for separate transmission assembly facilities, and, when used as a five-speed transmission, including a novel first and reverse duplex gear arrangement in the rear extension housing.

3,703,032
DIFFUSION BONDING PROCESS

Roy I. Batista, Palos Verdes Estates, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Aug. 14, 1970, Ser. No. 63,705
Int. Cl. B23k *5/22, 31/02*
U.S. Cl. 29—493 **6 Claims**

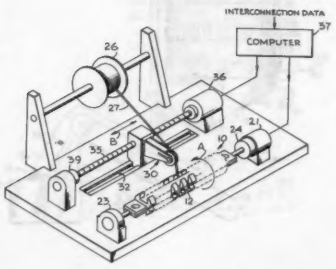


A diffusion bonding process may be performed by heating a joint of two metal tubes in tight restriction. The difference in the coefficient of thermal expansion between the metal tubes and a retaining sleeve and wedge causes radial pressure which diffusion bonds the tubes at the joint.

3,703,033
COMBINED COMPONENT AND INTERCONNECTION MODULE AND METHOD OF MAKING

Sergio A. Alessio, Elmhurst; Weichien Chow, Park Forest, both of Ill.; Marion Kosem, Willoughby Hills, Ohio, and Charles F. Valach, Western Springs, Ill., assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed June 22, 1970, Ser. No. 48,317
Int. Cl. H01b *13/00;* **H05k** *3/00*
U.S. Cl. 29—624 **7 Claims**

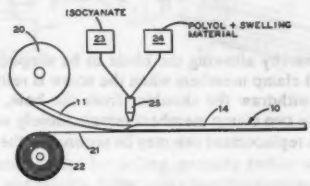


A combined component and interconnection module having a plurality of components, such as integrated circuit modules, directly mounted to and electrically connected with an interconnection pattern so as to avoid the need for the conventional printed circuit board or other external means normally required to provide interconnections between these components. The interconnection pattern is formed using computer-controlled winding apparatus to form wire loops in predetermined slots of a core in a predetermined sequence, the wire loops on one side of the core being cut to permit the remaining loops to provide the desired interconnection pattern. The components of the combined module are mechanically and electrically connected to the core and interconnection pattern by component terminals which pass into respect core slots for soldering to loop wire portions therein. Selected component terminals also may be advantageously adapted to serve as output terminals for the resulting combined module. Power busses may additionally be incorporated within the combined module. A number of advantageous assemblies for these combined modules are also disclosed.

3,703,034
METHOD OF MAKING WATERPROOF ELECTRICAL CABLE

Bernd Eilhardt, Vinnhorst, and Diethart Pelz, Langenhagen, both of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Division of Ser. No. 858,833, Sept. 17, 1969, Pat. No. 3,558,801. This application Sept. 14, 1970, Ser. No. 71,887
Int. Cl. H01b *13/00;* **B23k** *31/02*
U.S. Cl. 29—624 **3 Claims**

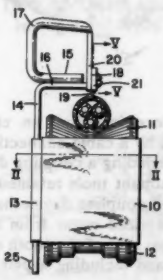


A method of making flexible waterproof electrical communications cable, having a filling disposed between the cable core and the sheath thereof; the filling being constituted of a synthetic resin foam which is of the open cell type; water swellable particle matter being distributed within the cells of the foam.

3,703,035
CABLE STRIPPER

Everett L. Handy, 77 Arizona Avenue, Holden, Mass.

Continuation of Ser. No. 792,927, Jan. 22, 1969, abandoned. This application June 14, 1971, Ser. No. 153,007
Int. Cl. B26b *27/00*
U.S. Cl. 30—90.9 **5 Claims**



In general, this invention relates to a device for stripping the outer covering of multi-strand electrical cable; more specifically, it has to do with a device that splits the covering along a given length of cable.

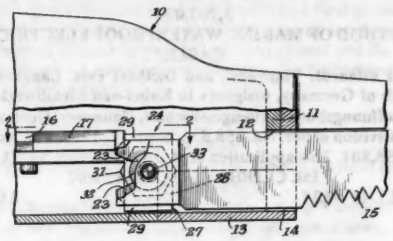
3,703,036
SEPARABLE CONNECTION MEANS FOR RECIPROCATING SAW BLADES

Ralph Karubian, 2001 Gage Avenue, Los Angeles, Calif.

Filed May 3, 1971, Ser. No. 139,782
Int. Cl. B26b *1/00*
U.S. Cl. 30—339 **6 Claims**

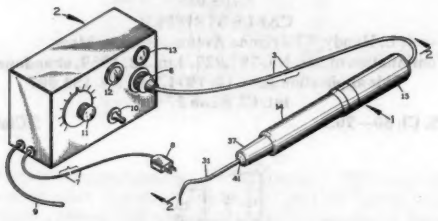
A separable connection between the end of a saw blade and the slide that reciprocates it, the connection including a

shoulder screw that tightens two clamp members, one on each side of said blade, one of said members being an integral part of the slide, the shoulder of said screw fitting the enclosed circular portion of a notch in said blade end when the latter is clamped, and said notch having a reduced leadin portion extending from the hole in the blade through the adjacent end of



the blade, thereby allowing the blade to be slipped out from between said clamp members when the screw is retracted sufficiently to withdraw the shoulder from the hole, while the screw and the two clamp members remain loosely attached to the slide so a replacement saw may be secured to the slide with easy facility.

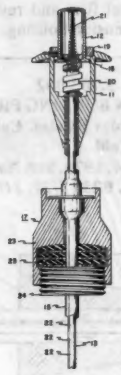
3,703,037
ULTRASONIC DENTAL HAND-PIECE WITH DETACHABLE TREATMENT TOOLS
Seymour Robinson, 1561 N.E. 179th Street, Miami, Fla.
Filed June 25, 1970, Ser. No. 49,642
Int. Cl. A61c *3/06*
U.S. Cl. 32—58 **5 Claims**



A dental hand-piece including an electronic ultrasonic transducer energized by a cable connecting an electronic ultrasonic generator including a coupling device for energizing interchangeable treatment tools retained in the hand-piece. Each of the tools and coupling device having a bore therein for conducting pressurized water from said hand-piece for supplying water to the area of the tooth contacted by the tip portion of the tool and including a pair of typical tools for tooth treatment.

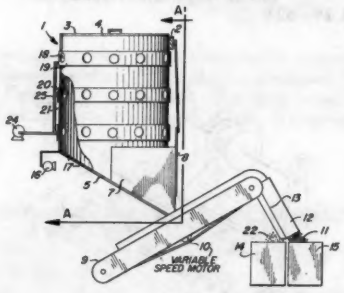
3,703,038
COMBINATION ROTATABLE OIL DIP STICK AND WIPER
Carroll G. Smith, P.O. Box 188, Arco, Idaho
Filed May 3, 1971, Ser. No. 139,489
Int. Cl. G01f *23/04*
U.S. Cl. 33—126.7 R **3 Claims**

The dip stick gauge of this invention includes a wiper housing at the entranceway of a fluid tank or reservoir having a multiplicity of resilient annular wiper rings engageable with the dip stick gauge being operable to wipe fluid residue from the gauge when it is removed from the tank or reservoir. The dip stick gauge assembly includes a hollow tubular housing having an opening in one of its side walls. A gauge rod is disposed in the tubular housing and includes indicia on one of its side walls coincident with the opening in the housing. Means is provided at one of the terminal ends of the rod being



operable to rotate the rod in the housing out of the opening so that fluid residue on the rod on the indicia will not be wiped from the indicia as the dip stick wiper gauge is removed from the wiper housing.

3,703,039
ANNEALING TOWER
Robert A. Hard, Lewiston; Loyal A. Stoyell, Tonawanda, and Claude F. Young, Niagara Falls, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.
Filed Dec. 10, 1969, Ser. No. 883,691
Int. Cl. F26b *19/00*
U.S. Cl. 34—174 **12 Claims**

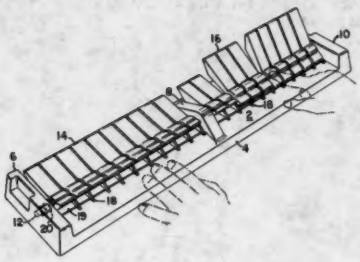


Method and apparatus for producing non-friable cast alloy shapes by controllably cooling them after casting. The alloy shapes are gravity fed through an annealing insulated tower at a controllable speed proportional to the rate and degree of cooling required to produce the optimum characteristics for the particular alloy shapes cast, such alloy shapes being ferrosilicon, silico-manganese, ferromanganese and the like.

3,703,040
KEYBOARD TEACHING AID
Raymond Roger Hill, 11 White Cottage, Angwin, Calif.
Filed July 6, 1970, Ser. No. 52,510
Int. Cl. G09b *13/02*
U.S. Cl. 35—5 **1 Claim**

A group of hand actuated keys are pivotally mounted on a

rod supported by a frame. Means are provided to prevent adjacent keys from interracting with each other while allowing a



key to be placed at any angle of rotation in order to provide teaching functions.

3,703,041

MAGNETIC TEACHING MACHINE WITH SELECTIVELY OPERABLE REPETITIVE AND NON-REPETITIVE LEARNING MODES

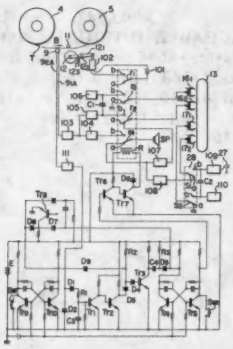
Yutaka Kohtani, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Shimomaruko, Tokyo, Japan

Filed Sept. 11, 1970, Ser. No. 71,514

Claims priority, application Japan, Sept. 20, 1969, 44/74987

Int. Cl. G09b 5/04; G11b 5/86

U.S. Cl. 35—35 C 5 Claims



An magnetic recording apparatus comprises a magnetic tape and an endless magnetic recording medium. The former carries information signals such as auditory teaching materials recorded upon the first track at a predetermined interval and control signals recorded upon the second track. In reproducing the information signals, they are reprinted or transferred upon the endless magnetic recording medium which has the length substantially equal to the length of the information signal record plus the length of the spacing between two adjacent information signals recorded in the first track of the magnetic tape. After the transfer of the information signals from the magnetic tape to the endless recording medium a student may record his imitation upon the endless recording medium. Thus, the information such as teaching materials and imitation recorded upon the endless recording medium may be repetitively reproduced if desired.

3,703,042

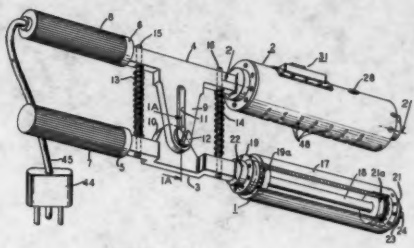
PORTABLE HAND-OPERATED PRESSING DEVICE FOR CLOTHING OR THE LIKE

Sally J. Smith, 299 Lyons Avenue, P.O. Box 4271, Newark, N.J.

Filed Dec. 9, 1970, Ser. No. 96,446

Int. Cl. A47j 51/00

U.S. Cl. 38—69 11 Claims



A portable device for rolling, pressing and/or steam-ironing garments and fabrics. Scissor-like handles manipulate a pair of cylinders which progressively clasp between them material to be pressed. At least one of the cylinders contains a heating element; and one or both of the cylinders are rotatable. In a preferred embodiment, one cylinder is stationary, and contains a water tank above the heating element for generating steam to moisten the fabric during the pressing operation.

3,703,043

STEAM IRON

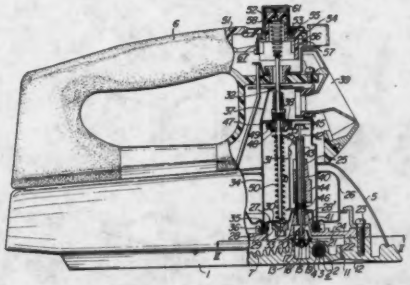
Nobutaka Ogata, Shijonawate; Riyouzi Kumamoto, Toyonaka, and Shuzi Asada, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 19, 1971, Ser. No. 163,609

Claims priority, application Japan, July 21, 1970, 45/64213; Aug. 20, 1970, 45/73610; April 5, 1971, 46/21137

Int. Cl. D06f 75/06

U.S. Cl. 38—77.83 13 Claims



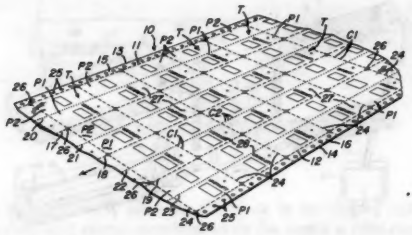
A steam iron in which a large number of steam nozzles are grouped into a plurality of groups and means for delivering steam to said respective groups is shiftable, from a state of delivering steam to any one of said groups to a state of delivering steam to any other selected group, and further indicator means is provided to indicate which of said groups steam is being delivered to.

3,703,044

WEB OF MULTIPART TICKETS AND METHOD OF MAKING AND USING SAME

Walter D. Gregory, Dayton, Ohio, assignor to The Monarch Marking System Company, Dayton, Ohio

Filed June 21, 1971, Ser. No. 155,170
Int. Cl. A44c 3/00
U.S. Cl. 40—2 12 Claims



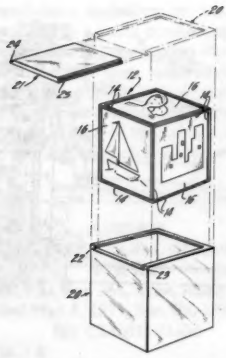
There are disclosed two embodiments of the invention relating to a web of multipart tickets capable of use in a high speed printer. The tickets are shown to be bounded by parallel lines of heavy partial severing and the parts of each ticket which extend in a transverse direction in the web are formed by lines of light parallel severing. Feed strips are provided at each margin of the web and each feed strip contains feed holes which are capable of being engaged by a conventional sprocket or tractor feed mechanism of a high speed printer. The part of each multipart ticket which is to be attached directly to the merchandise contains an aperture to facilitate attachment to the merchandise. Also disclosed is a method of making and using a web of multipart tickets.

3,703,045

PHOTO BLOCK

Morton Nyman, Riverdale, N.Y., assignor to Al Nyman & Son, Inc., New York, N.Y.

Filed Jan. 18, 1971, Ser. No. 107,306
Int. Cl. G09f 1/12
U.S. Cl. 40—152 6 Claims



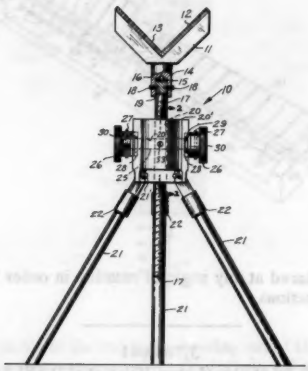
A photo display device is constructed of a transparent, closed cube-shaped shell in which a side of the shell is removable, by sliding movement in the plane thereof, for mounting of pictures against all six interior surfaces of the shell.

3,703,046

MICRO ADJUSTABLE SHOOTERS' TRIPOD

Antonio C. Barone, 74 Michele Drive, Depew, N.Y., and Stephen Jasinski, 42 Nassua Lane, Cheektowaga, N.Y.

Filed June 3, 1970, Ser. No. 42,996
Int. Cl. F41c 29/00
U.S. Cl. 42—94 2 Claims



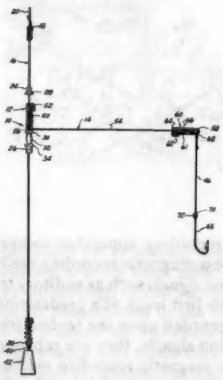
An adjustable mechanical device for supporting a rifle or pistol while taking aim, thus greatly increasing the shooters' accuracy. This device includes a V shaped rest portion for supporting the rifle or pistol, and may be used for target shooting from a bench or from the prone position after removing the leg extensions. The device also may be used for shooting from a sitting position when the leg extensions are slipped over the tripod legs. The V shaped rest member may be elevated to any desired position by nob controls.

3,703,047

QUICK-DETACHABLE OUTRIGGER FISHING DEVICE

Harold E. Schenavar, 18696 Inkster Road, Detroit, Mich., and Irving L. Pierce, 11363 Garfield, Detroit, Mich.

Filed May 10, 1971, Ser. No. 141,845
Int. Cl. A01k 91/04
U.S. Cl. 43—43.15 8 Claims



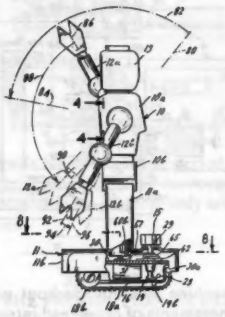
Slidably mounted between fixed stops on a drop wire weighted at its lower end with a sinker is a helical coiled wire spring having a diameter sufficiently larger than the diameter of the drop wire or leader to permit the sidewise displacement of the spring. This displacement provides a sufficient clearance therebetween to permit the insertion of the reversely-bent end portion of the vertical arm of an L-shaped

outrigger. The elongated approximately horizontal arm of the outrigger carries at its outer end a quick-operating coupling for a fish hook or for the leader of a fish hook. The outrigger is releasably secured to the spring by means of the reversely-bent end portion of the vertical arm.

3,703,048
TOY ROBOT

Julius Cooper, New Hyde Park, N.Y., assignor to Ideal Toy Corporation, Hollis, N.Y.

Division of Ser. No. 800,426, Feb. 19, 1969, Pat. No. 3,587,191. This application Jan. 27, 1971, Ser. No. 110,023
Int. Cl. A63h *13/02*
U.S. Cl. 46—148 **7 Claims**

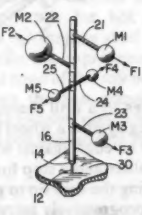


A toy robot having a first arm for automatically simulating a karate chop when the second arm is moved slightly. The arm operation is accomplished by rotating the right arm, thereby winding up a spring, and cocking it in a raised position. The cocking mechanism is released to allow the spring to force the right arm downward when the left arm is moved slightly.

3,703,049
WHIRLING TOY

Thomas S. Beaubien, Palos Verdes, Calif., assignor to Miller C. Johnson, Manhatten Beach, Calif., a part interest

Filed June 28, 1971, Ser. No. 157,173
Int. Cl. A63h *1/32*
U.S. Cl. 46—47 **10 Claims**

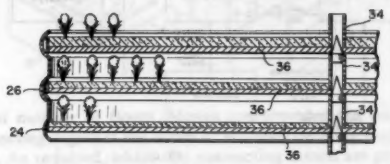


A toy in the form of an elongate member to be balanced vertically on the player's hand or finger and which, by rotary motion of the hand, can be made to whirl while being balanced. Weight centers in the toy are arranged so that the toy is dynamically balanced when the rotating axis is held vertically; but so that a centrifugal couple is formed when the lower end of the toy is moved in an arc around an imaginary vertical line that extends through the center of gravity of the toy when the device is held nearly vertically. In the preferred embodiment, the toy is composed of interconnected portions that include broad surface areas such, for example as different sections of a sheet material. The mass centers in that case are represented by the centroids at different areas of the toy. Two of the mass centers or centroids occur at vertically spaced points on one side of the rotational axis of the toy with the greater mass above. A third mass center is located on an opposite side of the rotational axis at a level intermediate the other two mass centers. That arrangement of the masses permits making the toy at low cost while facilitating the representation of various figures.

3,703,050
PALLET SPOOL ASSEMBLY

Paul R. Edwards, Redondo Beach, Calif., assignor to Edwards Enterprises of Orlando Inc., Orlando, Fla.

Filed Nov. 3, 1970, Ser. No. 86,535
Int. Cl. A01g *9/02*
U.S. Cl. 47—34.11 **2 Claims**



This invention relates to a pallet spool assembly comprising a central hub having means therein whereby a plurality of spools may be stacked, a substantially planar surface surrounding the hub and adapted to support a plant-growth medium, and rim means surrounding said planar surface and being of a height sufficient to retain a plant-growth medium on said planar surface.

3,703,051
METHODS FOR IMPROVING THE GROWTH CHARACTERISTICS OF PLANT MATERIAL SUCH AS SEEDS AND GROWING PLANTS

Pearl Weinberger, 290 Buena Vista Road, Ottawa, Ontario, Canada

Continuation-in-part of Ser. No. 808,260, March 18, 1969, abandoned. This application July 29, 1971, Ser. No. 167,444
Int. Cl. A01c *1/00*
U.S. Cl. 47—58 **4 Claims**

The growth characteristics of plant material such as seeds and growing plants are improved by means of subjecting the material to vibrations of predetermined frequencies. Chilling is required for seeds exposed to audible frequencies although the chilling is optional when the seeds are exposed to higher frequencies. Also, the seeds must be imbibed to a certain extent when subjected to audible frequencies, the extent of imbibition being controlled through the agency of physical or physiological limitations. In the audible range, the seeds are exposed for a minimal optimal period of four weeks. Seeds exposed to ultrasound frequencies may be, however, air dry and are exposed in such range for at least several seconds.

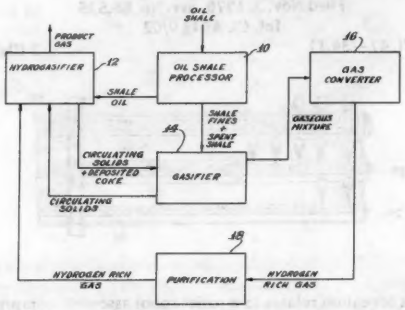
3,703,052
PROCESS FOR PRODUCTION OF PIPELINE QUALITY GAS FROM OIL SHALE

Henry R. Linden, La Grange Park, Ill., assignor to Institute of Gas Technology

Filed Nov. 12, 1970, Ser. No. 88,652
Int. Cl. C01b *2/14, 2/22*
U.S. Cl. 48—215 **17 Claims**

A process for producing a high methane content, synthetic pipeline gas from oil shale. Oil shale is processed so as to provide a shale oil fraction, and solids including shale fines and spent shale. The shale oil and a hydrogen rich gas are introduced into a hydrogasifier chamber which is maintained at a temperature of about 1,100°–1,600° F., and at a pressure of about 500–2,000 psig, so as to convert the shale oil by hydrogasification into a high methane content, synthetic

pipeline gas, normally liquid aromatic hydrocarbons, and a carbonaceous solid residue. Pulverized solids are passed through the hydrogasifier and into a gasifier chamber, maintained at a pressure of about 500–2,000 psig. and at a temperature of about 1,500°–2,100° F., to remove the carbonaceous residue or coke formed in the hydrogasifier. Shale fines and spent shale are also introduced into the gasifier wherein a gaseous mixture is formed by reaction with steam and oxygen or with steam and air. The gaseous mixture is then converted to a hydrogen rich gas either directly, by a carbon monoxide shift reaction (when steam and oxygen are used in



the gasifier) or indirectly, by the steam-iron process (when steam and air are used in the gasifier). In the steam-iron process, the gaseous mixture is the reducing agent for iron oxides formed when added steam is converted to hydrogen over the reduced iron oxides.

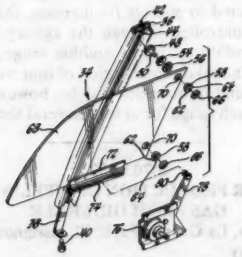
The hydrogen rich gas is purified and primarily includes hydrogen alone, in the case of the steam-iron process, or a combination of hydrogen and methane, in the case of the carbon monoxide shift process. This hydrogen rich gas is thereafter introduced to the hydrogasifier chamber to form the high methane content gas. All or a portion of the solids leaving the gasifier are recirculated back to the hydrogasifier.

3,703,053

VEHICLE WINDOW INSTALLATION

Delbert D. De Rees, Utica, and Gerald R. Walker, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 17, 1971, Ser. No. 181,350
Int. Cl. E05d *15/16, 13/02*
U.S. Cl. 49—428 **3 Claims**



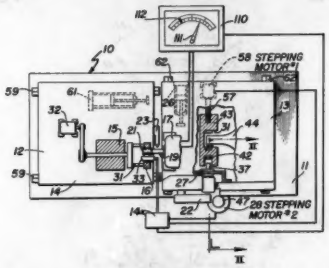
A door mounted vehicle window installation particularly adapted for easy positional adjustment of the window, the installation including a guide member projecting above the upper margin of the door and carrying a pair of follower units each having a pivot shaft projecting perpendicularly to the path of motion defined by the guide member, a pair of circular eccentric bushings each rotatably supported on a respective one of the pivot shafts, and a window having a pair of circular apertures therein adapted to rotatably receive a corresponding one of the bushings. When the window is in a closed or raised position, each bushing is situated above the upper margin of the door for easy accessibility and each functions upon rotation about the corresponding pivot shaft to shift the position of the window relative to the door.

3,703,054

GRINDING MACHINE

Herbert R. Uhtenwoldt, Worcester, Mass., assignor to Cincinnati Milacron-Heald Corp., Worcester, Mass.

Filed May 17, 1971, Ser. No. 143,926
Int. Cl. B24b *49/04*
U.S. Cl. 51—165.91 **5 Claims**



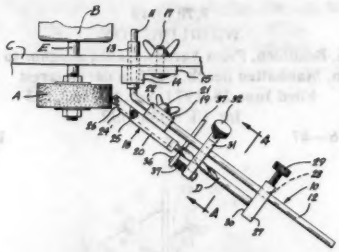
A grinding machine wherein sparkout grinding is carried out with small increments of cross-feed introduced every time the load drops to a predetermined value.

3,703,055

DRILL SHARPENING DEVICE

Samuel Niquet, Charbonneau Avenue, East Freetown, Mass.

Filed Jan. 25, 1971, Ser. No. 109,296
Int. Cl. B24b *3/26*
U.S. Cl. 51—219R **2 Claims**



The invention relates to a drill sharpening jig in which the drill is held for grinding against a wheel by a pivotable support which has a table with an edge against which the flute edges of the drill are held, a holder and a stop for the chuck end of the drill, the support causing the drill tip to generate a conical surface for producing a progressively increasing clearance angle for the drill cutting edges.

3,703,056

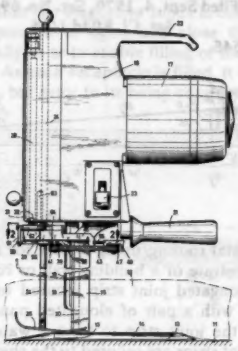
KNIFE GRINDING DEVICE FOR A MOTOR-DRIVEN CUTTING TOOL

Boris Langhoff, Backnang, Germany, assignor to Krauss & Reichert Spezialmaschinenfabrik, Fellwach, Germany

Filed May 13, 1971, Ser. No. 143,010
Claims priority, application Germany, May 27, 1970, P 20 25 854.2
Int. Cl. B24b *19/00*
U.S. Cl. 51—246 **4 Claims**

In a motor-driven cutting tool, at either side of the knife there are arranged rotary grinding elements supported by a

grinder head reciprocating parallel to the knife. Mechanical means are provided which, as the grinder head moves in the one or the other direction, displace the one or the other grinding element and cause them to engage and thus grind al-



ternately the two knife blade faces. The period of applying the force to said grinding elements during the reciprocation of the grinder head is changeable for grinding only selected ranges of the knife blade faces.

3,703,057

METHOD FOR THE PRODUCTION OR RESTORATION OF WORKING ROLLS FOR HOT ROLLING OF METALLIC FLAT PRODUCTS

Johann Krausz, and Johan Feichtinger, both of Linz, Austria, assignors to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft, Linz, Austria

Filed Dec. 23, 1970, Ser. No. 101,077

Claims priority, application Austria, Dec. 24, 1969, 12039/69

Int. Cl. B24b *1/00*

U.S. Cl. 51—326 **4 Claims**

The invention relates to a method for the production or restoration of working rolls for hot rolling metallic flat products, in particular for shaping steel slabs to pre-strips on broad strip mills, wherein the improvement resides in that the central circumferential zone of the roll body is provided with a greater coarseness than the two marginal zones. With this process it is possible to employ rolls with great hardness and yet obtain an excellent roll bite, so that the efficiency is greatly enhanced.

3,703,058

MODULAR BUILDING CONSTRUCTION AND ERECTION SYSTEM UTILIZING SELECTIVELY ORIENTED MODULES

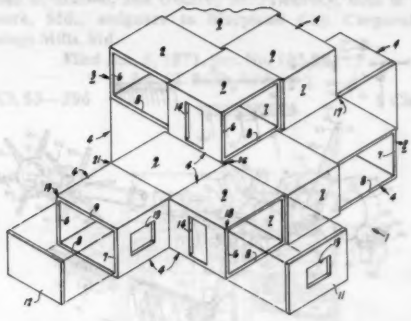
George G. Klett, Berkeley, and Gary L. Akerstrom, Moraga, both of Calif., assignors to Building Block Modules, Inc., Richmond, Calif.

Filed Sept. 14, 1970, Ser. No. 71,978

Int. Cl. E04h *1/04*

U.S. Cl. 52—79 **14 Claims**

This invention relates to a low cost system for erecting multi-room buildings from preformed modules. Precast concrete modular units having opposing side walls and opposing floor and ceiling panels are oriented in relationship to each other so that a side wall of one module closes off selectively, at least partially, an open end of an adjacent module. Fill-in end wall panels are utilized as required to complete a building construction. Additional floor levels stacked on lower levels are employed to provide a building assembly having a predeter-



mined number of floors. Means are provided for integrally connecting together the series of modules defining each floor level. As required, additional connecting means are provided to secure overlying floor levels with floor levels lying therebelow.

3,703,059

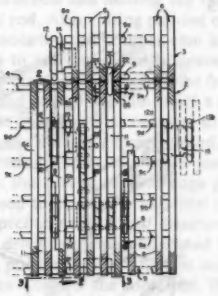
EXTENSIBLE PERFORATE FLOOR MAT AND FRICTION DEVICE

Milton Kessler, 6690 Harrington Avenue, Youngstown, Ohio

Filed June 28, 1971, Ser. No. 157,101

Int. Cl. E04f *15/00*

U.S. Cl. 52—177 **7 Claims**



A perforate plastic floor mat and friction device having an upper surface of parallel narrow strips spaced apart approximately their own width, and a lower surface of more widely spaced strips underlying and crossing the upper strips to provide rectangular apertures, and plastic connectors having locking portions fitting into said apertures and engaging the upper and lower strips to lock together smaller such mats into larger ones.

3,703,060

HARVESTING REEL

Donald R. Gradwohl, and Archie E. Neal, both of Garfield, Wash., assignors to J. E. Love Company, Garfield, Wash.

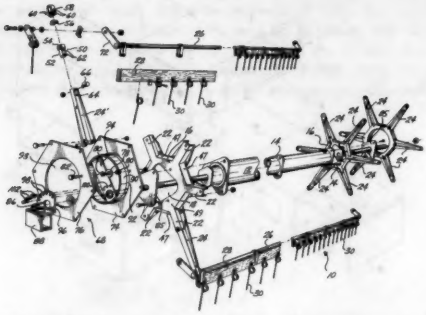
Filed Oct. 1, 1970, Ser. No. 77,132

Int. Cl. A01d *57/02*

U.S. Cl. 56—226 **3 Claims**

A plurality of identical spiders are removably secured to an elongated, lightweight, thin walled center tube having good resistance to bending. Each spider comprises a hub member having short arm stubs and elongated arm section secured to the stubs. The arm stubs and the arm sections are of channel

form in cross section, and each includes radially disposed web and gusset portions providing resistance to bending angularly of the reel and flanges of substantial depth providing resistance to bending axially of the reel. Bat support shafts are secured to the outer ends of the arms and tine carrying bats

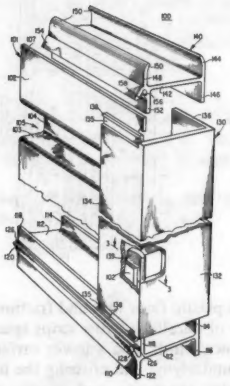


are secured to these shafts. The radial inner space between the shafts and bats and the center tube is devoid of any truss structure which would interfere with the operation of the pick-up reel. The bats are driven by an eccentric mechanism which includes a plurality of bearings which ride on the outer periphery of a cylindrical track.

3,703,061
OVERHEAD DOOR CONSTRUCTION

John P. Holland, and Hein Aykens, both of Sterling, Ill., assignors to Frantz Manufacturing Company, Sterling, Ill.

Filed July 7, 1970, Ser. No. 52,952
Int. Cl. E04b *5/52*; E06b *3/54*
U.S. Cl. 52—475 **19 Claims**

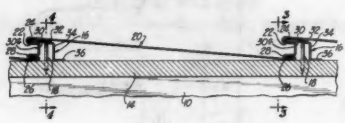


A section of a sectional overhead garage door comprises a ribbed, plastic panel surrounded by a frame including two horizontal rails interconnected by two end rails, each horizontal rail having two spaced-apart holding flanges extending the length thereof toward the other horizontal rail and receiving the adjacent panel margin therebetween, the outer holding flange having a gripping member thereon extending toward the inner holding flange, each end rail having a tongue at each end thereof disposed in use between the adjacent panel margin and the adjacent outer holding flange and provided with an outwardly extending gripping member thereon, the holding flange gripping members being pressed into and embedded in the end rail tongues and the panel margins, with the tongue gripping members being embedded in the outer holding flanges all for securely clamping the frame to the panel and the end rails to the horizontal rails.

3,703,062
SHEET METAL ROOFING/SIDING SYSTEM WITH SEPARABLE FASTENER

John S. McKinney, Newburgh, Ind., assignor to American Metal Climax, Inc., New York, N.Y.

Filed Sept. 4, 1970, Ser. No. 69,585
Int. Cl. E04d *1/34*
U.S. Cl. 52—545 **5 Claims**

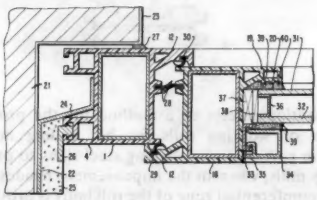


A sheet metal roofing/siding system for application on the sheathing substrate of a building wall or roof structure comprising an elongated joint strip secured to said structure in combination with a pair of elongated panel members interlocked with the joint strip to form a watertight cover. The elongated joint strips are secured to the sheathing substrate of the building structure in parallel, spaced apart configuration and the panel members are interlocked with the joint strips along upper and lower marginal edges to provide a lap siding type appearance which is watertight and easy to install and apply.

3,703,063
PROFILE MEMBER FOR WINDOWS, DOORS, FACADES, OR THE LIKE

Wolfgang Budich, Sieglar; Hans Theissen, Eschmar; Hans Schaefer, Cologne-Nippes, and Walter Andree, Troisdorf, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed April 22, 1970, Ser. No. 30,832
Claims priority, application Germany, April 22, 1969, P 19 20 248.3
Int. Cl. E04c *3/30*
U.S. Cl. 52—727 **8 Claims**



A profile member for windows, doors or the like formed by a hollow closed metal section having a shell of synthetic material providing one or more projections including a glaze projection for accomodating a glass pane, a connecting projection which facilitates connection of the member to a structural building part, and an abutment projection for effecting contact producing closure with another profile member.

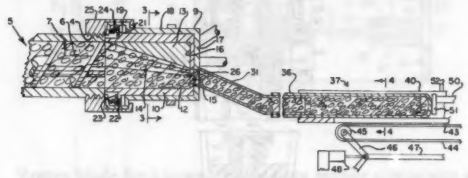
3,703,064
PACKAGING OF MEAT

Robert C. Lugiewicz, Monroeville, Pa., assignor to Cubb-Pac Corporation, Pittsburgh, Pa.

Filed March 30, 1970, Ser. No. 23,626
Int. Cl. B65b *63/02*
U.S. Cl. 53—122 **6 Claims**

A package of meat comprising discrete pieces of meat compacted and shaped into a solid bar tightly encased within a flexible, tubular receptacle closed at both ends. The bar of meat is formed by introducing the meat pieces to a housing

within which is a continuously rotating conveyor screw by means of which the meat pieces are conveyed to the discharge end of the housing that has a plurality of openings with each of which is associated an elongate tube. Each tube receives the open end of a flexible receptacle and the discharge of meat from the housing into the respective tubes is controlled by a valve which is operable to open and close the discharge openings sequentially so as to enable filling of the receptacles one after another. As each receptacle is filled, it is pushed off its associated tube, but prior to its being completely filled the



valve is operated to close the opening through which the meat is discharged and open another opening, thereby discontinuing the filling of the one receptacle and beginning the filling of another receptacle. The partially filled receptacle is removed from its associated tube and the unfilled portion of the receptacle is closed so as to provide a sealed package. During the filling of the other receptacle, a fresh receptacle may be placed over the tube from which the partially filled receptacle was removed, thereby enabling successive packages of meat to be formed continuously.

3,703,065

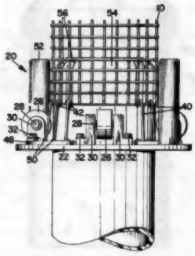
SLEEVING APPARATUS

Arnold Soodalter, 134 Tanglewood Drive, Longmeadow, Mass.

Continuation-in-part of Ser. No. 41,005, May 27, 1970, Pat. No. 3,657,861. This application Nov. 6, 1970, Ser. No. 87,559

Int. Cl. B65b *63/00, 67/00;* **A22c** *13/00*

U.S. Cl. 53—197 **3 Claims**



Apparatus for sleeving butcher's netting onto a magazine comprising, a sleeving device having an opening therein, a supply of netting extending through the opening to the magazine, guide means and resilient fingers integral with the sleeving device and surrounding the opening and extending thereinto, the resilient fingers having offset free ends adapted for engagement with the netting on the magazine, whereby, upon movement of the sleeving device in one direction the guide means guide the apparatus relative to the magazine and the offset free ends of the fingers engage the netting and load it onto the magazine, and upon movement of the sleeving device in an opposite direction, the guide means guide the apparatus relative to the magazine and the offset free ends of the fingers slide freely relative to the netting preparatory for the next purchase.

3,703,066

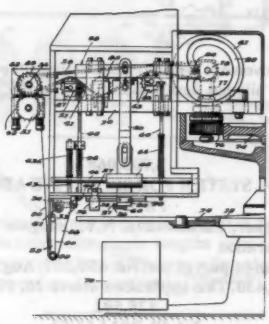
APPARATUS FOR FEEDING HEAT SHRINKABLE PLASTIC FILM AND CAPPING CONTAINERS THEREWITH

Thomas E. Marion, and Godfrey M. Priborsky, both of Baltimore, Md., assignors to Maryland Cup Corporation, Owings Mills, Md.

Filed Jan. 5, 1971, Ser. No. 103,984

Int. Cl. B65b *7/28*

U.S. Cl. 53—296 **9 Claims**



A feed mechanism is provided for a roll of sheet material, said material being shrink film for capping and closing the open end of a container. The feed of the film is directed downward from the roll and faked as it is unrolled around a tension rod freely mounted in vertical elongated openings formed in spaced brackets and holding the film suitably taut by the weight of the rod. Also, during pay-out of the film from around the freely mounted rod, a timer cam is rotated at the top of the machine to activate a pair of spaced clamps with gripping fingers to a clamping position of the free end of each corner of the film and to pull the film sheet a predetermined distance to cover the open top of a container to be capped and sealed. The clamps are normally spring closed, until one-way cam means momentarily open the same just prior to the clamping action on the film to receive edge portions of the film and then released to close over said film to pull the film sheet for the said predetermined pull distance. A linkage is timed by the timer drive cam and is operated to transversely cut the sheet into a portion with a sufficient marginal portion to overhang the open mouth of the container. The container is mounted on an elevator means to be elevated into a heat sealing area, so the marginal area is sealed by heat over the top of the container, whereupon when the elevator is lowered the capped container may be removed and the film feeding and capping repeated.

3,703,067

ROTATING CARTON FLAP MANIPULATOR

Calvin C. Goodrich, Wyoming, Ohio, and Eugene V. Krummen, Fort Mitchell, Ky., assignors to The Proctor & Gamble Company, Cincinnati, Ohio

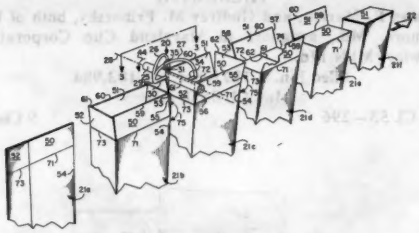
Filed Oct. 6, 1970, Ser. No. 78,426

Int. Cl. B65b *7/20*

U.S. Cl. 53—374 **4 Claims**

A spirally configured carton flap manipulator is disclosed that is rotated in timed relation to columnarly advancing cartons having end closure forming flaps projecting substantially coplanarly with their respective carton sides. The rotating flap manipulator has its axis of rotation oriented generally transverse the direction of travel of the moving cartons and disposed outwardly from the projecting flaps. Its spiral

camming element is adapted to impose a camming force on a flap having its proximal edge aligned parallel to the direction



of carton movement without obstructing other carton flaps, whereby the aligned flap is rotated outwardly about its proximal edge.

3,703,068

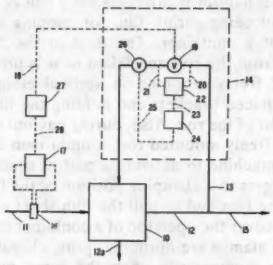
CONTROL SYSTEM FOR SELECTIVE ADSORPTION PROCESS

John L. Wagner, Lackawanna, N.Y., assignor to Union Carbide Corporation

Continuation-in-part of Ser. No. 659,381, Aug. 9, 1967, Pat. No. 3,418,430. This application March 26, 1971, Ser. No. 128,591

Int. Cl. B01d *53/02*

U.S. Cl. 55—21 **21 Claims**



A pressure swing process for selective adsorption of feed gas components is controlled by maintaining a predetermined constant ratio of relative adsorption rate to repressurization product gas flow rate, and preferably cycling the adsorbent beds in response to termination of the repressurization step.

3,703,069

COMPRESSED AIR FILTER

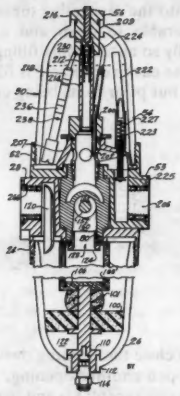
Harry L. Wheeler, Jr., c/o DK Pneumatics, Incs., 1090 Jefferson Street, N. W., P. O. Box 2427, Atlanta, Ga.

Division of Ser. No. 734,664, June 5, 1968, Pat. No. 3,559,764. This application Jan. 21, 1970, Ser. No. 8,117

Int. Cl. B01d *50/00*

U.S. Cl. 55—337 **8 Claims**

The air filter, the air regulator and the air lubricator, one or more of which are used in compressed air lines, such as those driving power tools, each having its own housing which may be selectively connected to one or more of the other housings to provide either a vertical or horizontal arrangement with respect to the air line axis with or without the use of fitting connections. The filter includes the metallic head containing inlet and outlet ports, a plastic chamber or bowl and a foraminous device therein to remove entrained impurities from the air and a collector to separate water from the air stream. The regulator includes a metallic casting with a valve means of controlling air flow responding to the diaphragm. The lubricator includes the metallic head containing inlet and outlet ports, a plastic chamber or bowl defining a reservoir and means to discharge oil vapor into the outlet port at a prescribed rate. By selective fitting of the housings together, communication is established through the inlets and outlets already provided therein and means is provided for securing the selected filter, or regular or lubricator together. The respective housings interlock and nest together in different relationships to fit into existing spaces or to save space.



3,703,070

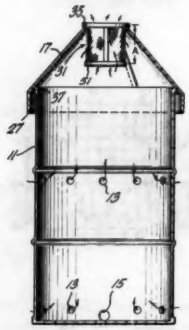
INCINERATOR HOOD

Paul G. Pasichnyk, 2617 Bedford Road, Lansing, Mich.

Filed June 10, 1970, Ser. No. 45,186

Int. Cl. B01d *35/12;* **F23j** *15/00*

U.S. Cl. 55—526 **3 Claims**



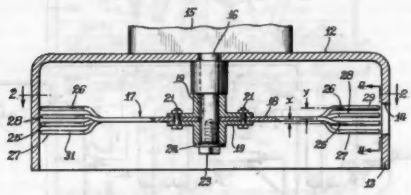
This invention relates to outdoor refuse burning containers and more particularly to such containers incorporating a hood for improved filtration of burned products, for ordinary outdoor refuse burning barrels. A conical hood for such a barrel is provided, the hood being disposed over the barrel in a lift-off relation; and having a combustion product discharging vent with a removable filter cartridge inserted therein. The cartridge is pervious to escape of the burn products and presents an extended cartridge length through which these incineration products must pass to escape from the chamber. The combustion products are forced to pass first through the walls of a generally cylindrical cartridge, formed of thin sheets of expanded metal, and then through the interior of the cartridge which comprises a second labyrinthine path constituted of strips of expanded metal stuffed into the interior of the cartridge.

3,703,071

ROTARY BLADE FOR MULCHING LAWN MOWER

Charles I. Anderson, 7399 Main Street, Downers Grove, Ill.

Filed Feb. 17, 1972, Ser. No. 227,194
Int. Cl. A01d *55/18*
U.S. Cl. 56—295 4 Claims



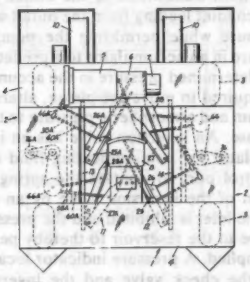
Rotary blade for a power-driven lawn mower comprising an elongate body terminating at each end in a plurality of integral cutting fingers parallel to and displaced successively below and above the plane of the body with each finger defining a different plane and the upper surfaces of the leading edges of the fingers and the lower surfaces of their trailing edges chamfered to form cutting edges, whereby top-to-bottom reversal of the blade presents as leading cutting edges those that were trailing edges.

3,703,072

RASPBERRY HARVESTER

Albert W. Patzlaff, Holland, Mich., assignor to Blueberry Equipment, Inc., South Haven, Mich.

Filed Dec. 20, 1971, Ser. No. 209,602
Int. Cl. A01g *19/00*
U.S. Cl. 56—330 13 Claims



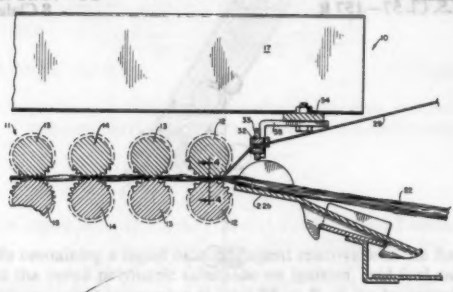
A mobile carriage has vertical bush engaging frames in opposed relation to engage opposite sides of the bushes as the carriage advances along a crop row. The frames are divided horizontally into upper and lower sections. The frames are further divided vertically into leading and trailing sections. The frame sections are vertically pivoted at their leading ends and have rearwardly extending vertically spaced flexible bush engaging rods. Each pair of opposed sections has one section that is spring biased inwardly toward the side of the bush, while the opposed section is vibratorily oscillated about its pivot to engage and shake the opposite side of the bush. The leading sections on one side of the machine are oscillated, while the trailing sections on the opposite side are oscillated. Separate and independent drive motor oscillate the driven frame sections on opposite sides of the machine; while the upper and lower driven frame sections can be oscillated in different and variable phase sequence.

3,703,073

ANTISTATIC YARN PRODUCTION

Reid C. Goodbar, and Arther Mitchell Pressley, both of Ware Shoals, S.C., assignors to Riegel Textile Corporation, Ware Shoals, S.C.

Filed Aug. 14, 1970, Ser. No. 63,755
Int. Cl. D01g *1/08*; D01h *5/72*
U.S. Cl. 57—36 9 Claims



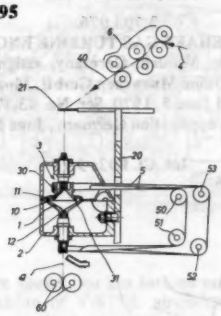
There is disclosed a method and apparatus for producing yarn having discontinuous staple lengths of metal filaments uniformly interspersed therein by preventing slubbing of the metal multifilament tow during drawing thereof.

3,703,074

METHOD AND APPARATUS FOR SPINNING SLIVER

Stefan Staneff, Herzogenaurach, Germany, assignor to Industriewerk Schaeffler OHG, Herzogenaurach, Germany

Filed July 8, 1971, Ser. No. 160,742
Claims priority, application Germany, July 9, 1970, P 20 34 094.7
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.95 7 Claims



Sliver is drafted immediately prior to its introduction into a supply passage to an open-end-spinning device, and the supply passage housing is rotatable to impart twist to the sliver so that the fibers in such sliver will be straightened and held in substantially parallel relationship until the sliver end is subjected to separation into individual fibers by the spinning apparatus. The inner mouth of the supply passage is located closely adjacent to the spinning chamber fiber collection face so that the fibers will be positively moved by the spinning forces, such as centrifugal, suction or electrostatic forces, to maintain the fibers in substantially parallel relationship, even though separated from the sliver in the spinning chamber. The sliver is gripped at the edge of the inner supply passage mouth to facilitate twisting of the sliver in the passage and to hold the sliver to facilitate separation of the individual fibers from the sliver end extending beyond the supply passage mouth in response to spinning forces. Such gripping may be effected simply by the configuration of the passage mouth which bends the sliver to frictionally engage the mouth edge, by roughening the mouth edge, or by providing a positive clamp glidably engaging the sliver.

3,703,075

METHOD OF MAKING A YARN CONTAINING LOOPS

Otindra Nath Bose, Hollingworth, England, assignor to English Sewing Limited, Manchester, England

Filed Jan. 28, 1971, Ser. No. 110,464

Claims priority, application Great Britain, Feb. 7, 1970, 5,977/70

Int. Cl. D02g 1/02

U.S. Cl. 57—157 R 8 Claims

A textured yarn is made by continuously false untwisting and reverse twisting a previously twisted and heat set continuous multi-filament thermoplastic yarn and over-feeding the yarn so that the filaments thereof can form loops. The textured yarn so produced can be plied together and twisted and then again heat set to form sewing thread.

3,703,076

TWIN SHAFT GAS TURBINE ENGINE

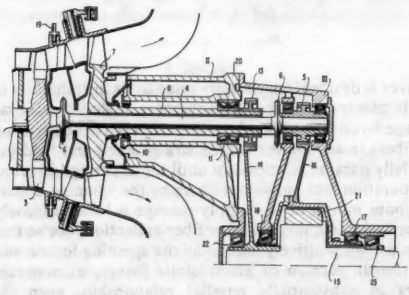
Klaus Hagemeister, Munich, Germany, assignor to Motoren-Und Turbinen-Union Muenchen GmbH, Munich, Germany

Filed June 5, 1970, Ser. No. 43,778

Claims priority, application Germany, June 6, 1969, P 19 28 660.3

Int. Cl. F02c 3/10

U.S. Cl. 60—39.16 21 Claims



A twin-shaft gas turbine engine, which includes a gas generator with compressor and compressor turbine, a power turbine and a transmission, and in which, for purposes of braking operation, an intermediate shaft extends through the hollow power turbine output shaft to connect the rotor of the gas generator with the transmission; an engageable clutch associated with the intermediate shaft permits selective operation.

3,703,077

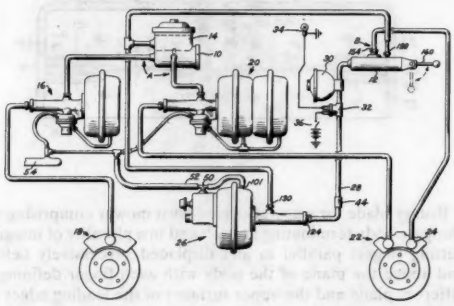
VACUUM PUMPING DEVICE

Maxwell L. Cripe, South Bend, Ind., assignor to The Bendix Corporation

Filed Nov. 23, 1970, Ser. No. 91,641

Int. Cl. F03b ; F01l 31/02; F16d 65/24

U.S. Cl. 60—51 6 Claims



A power braking system having a vacuum operated pumping device for supplying fluid under pressure to operate a spring braking device. The pumping device has a housing with an internal cavity divided by a wall member. Vacuum is maintained on one side of the wall member while vacuum and atmospheric pressure are alternately communicated to the other side. This alternate communication will create a pressure differential across the wall member causing the wall member to reciprocate in the cavity. A cylinder having an inlet connected to a reservoir and an outlet operatively connected to the spring braking device contains a piston attached to the wall member. As the wall member reciprocates, the piston will pressurize the fluid transmitted to the outlet. A check valve located in the conduit leading from the outlet will prevent any backflow pressure while permitting the pumping device to raise the pressure in an accumulator to a predetermined value. When this predetermined pressure in the accumulator is equal to the force required to move the piston, alternate communication of vacuum and atmospheric pressure to the rear will automatically cease. An inversion valve has an inlet connected to the accumulator for communicating fluid under pressure through a control port to operate the spring brake device. Upon actuation of the inversion valve by an operator, fluid flow through the inlet is inhibited and the pressurized fluid allowed to escape to the reservoir to thereby permit the spring brakes to be applied. A pressure indicator located in the conduit between the check valve and the inversion valve will transmit a signal to an indicator to alert the operator if a low pressure condition is present in this braking system.

3,703,078

RAPID RESPONSE FLUID DRIVE

Richard M. Nelden, Southfield, and Thomas J. Ryan, Detroit, both of Mich., assignors to American Standard Inc., New York, N.Y.

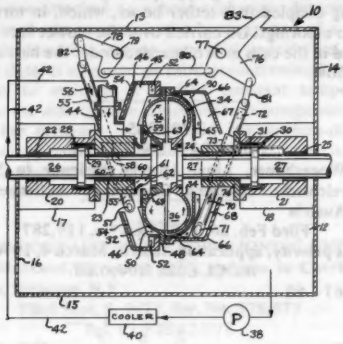
Filed April 19, 1971, Ser. No. 134,949

Int. Cl. F16d 33/06

U.S. Cl. 60—54 9 Claims

A fluid coupling equipped with means for admitting liquid to the work chamber at a variable rate for effecting quick output speed changes. The admitting means includes a rotating

reservoir containing a reserve ring of liquid, and a scoop tube movable into the reservoir to extract liquid from the ring at a



variable rate in accordance with the scoop tube position, and the replenishment rate for the reservoir.

3,703,079

HYDRAULIC ACTUATING SYSTEMS

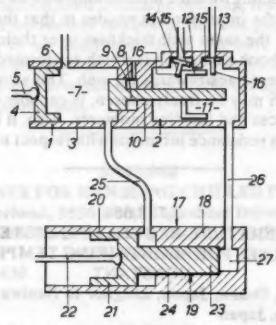
Brian Ingram, Balsall Common, and David Anthony Harries, Monkspath, Solihull, both of England, assignors to Girling Limited, Birmingham, England

Filed Sept. 11, 1970, Ser. No. 71,448

Claims priority, application Great Britain, Sept. 16, 1969, 45,562/69

Int. Cl. F15b 7/00

U.S. Cl. 60—54.5 E **10 Claims**



In an hydraulic system, a slave cylinder for operating a control member, for example a clutch lever of a vehicle, is adapted to be actuated by the supply of hydraulic fluid under pressure from a pressure space of a pedal-operated master cylinder. A valve actuated in response to the fluid pressure supply from the master cylinder is adapted to control the supply of high pressure fluid from a high pressure source to a second slave cylinder.

3,703,080

HYBRID ROCKET PROPELLANT USING POLYMERIC SPONGE AND LIQUID OXIDIZER

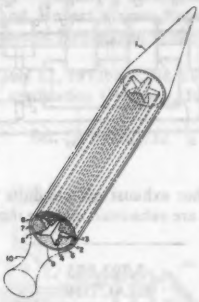
John P. Longwell, Scotch Plains, N.J., assignor to Esso Research and Engineering Company

Filed June 2, 1959, Ser. No. 817,970

Int. Cl. C06d 5/10

U.S. Cl. 60—219 **10 Claims**

9. A method for developing thrust in a rocket combustion chamber by combusting a by-propellant which comprises igniting a rubbery sponge having cells and an intercellular matrix of cured solid polymeric substance and propellant fuel in said matrix mixed with the cured polymeric material, said



cells containing a liquid oxidizing agent reactive with the fuel and the cured polymeric substance on ignition, said fuel and oxidizing agent composing at least 75 wt.% of the by-propellant.

3,703,081

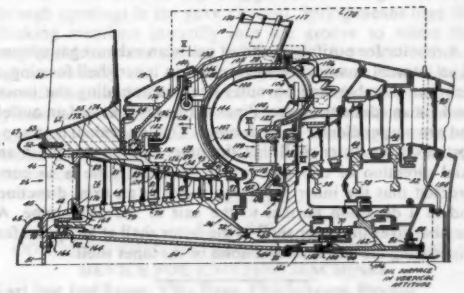
GAS TURBINE ENGINE

James N. Krebs, Marblehead, and Elmir E. Paulson, Topsfield, both of Mass., assignors to General Electric Company

Filed Nov. 20, 1970, Ser. No. 91,286

Int. Cl. F02k 3/06; F02c 7/06

U.S. Cl. 60—226 R **39 Claims**



The disclosure shows two gas turbine engines particularly suited to propulsion of V/STOL aircraft. The engines are characterized by a short axial length relative to diameter which is attributable to several features. These features include, singly and in combination, a toroidal combustion chamber having a reversely folded combustion zone, a bearing system for counter-rotating engine rotors, a shell construction for a counter-rotating compressor, and a lubrication system employing a rotor shaft as the pumping element. Other related features are also described.

3,703,082

APPARATUS FOR THE DETOXIFICATION OF EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

Andres Santiago, and Enrique Santiago, both of Augsburg, Germany, assignors to Zeuna-Staerker KG, Augsburg, Germany

Filed Sept. 13, 1971, Ser. No. 179,758

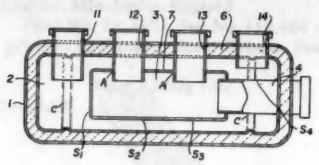
Claims priority, application Germany, Sept. 16, 1971, P 20 45 658.0

Int. Cl. F01n 3/10; F02b 75/10

U.S. Cl. 60—282 **18 Claims**

An after burning device for an internal combustion engine has an inner combustion chamber totally enclosed in an outer,

heat insulated combustion chamber. Some of the exhaust gas conduits form the engine exhaust directly into the outer

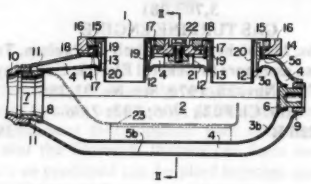


chamber, while other exhaust gas conduits pass through the outer chamber and are exhausted into the inner chamber.

3,703,083
REACTOR

Tomoo Tadokoro, Kure, Japan, assignor to Toyo Kogyo Co., Ltd., Aki-gun, Hiroshima-ken, Japan

Filed Jan. 12, 1971, Ser. No. 105,864
Claims priority, application Japan, Jan. 14, 1970, 45/4110
Int. Cl. F01n *3/10*
U.S. Cl. 60—322 **9 Claims**

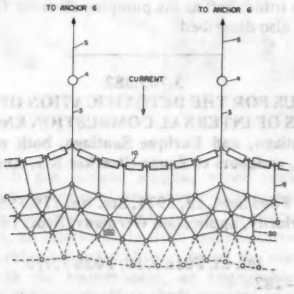


A reactor for purifying exhaust gas in an exhaust gas system of an internal combustion engine has an inner shell forming a reaction chamber and an outer shell surrounding the inner shell via an adiabatic space. Pipes define an inlet and an outlet and are perpendicular to each other. The inner shell is so supported on the outer shell that the inner shell may slide in an axial direction of one pipe while the other pipe is so constructed that the inner shell may move in an axial direction and in a direction normal to the axis of the other pipe. A member fixes the inner shell to the outer shell at any point for eliminating the vibration and noise of the inner shell.

3,703,084
BOOM SYSTEM FOR OIL CONTAINMENT

John B. Nugent, Winthrop, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 13, 1971, Ser. No. 106,225
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F **2 Claims**

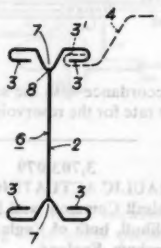


An improved boom system for the containment of oil spills on the surface of water, essentially comprising a multiplicity of intercoupling cells comprising floatatable material, open at top and bottom, forming an in-depth barrier that is wave conformal, the barrier being appropriately stabilized by weights and being coupled to a tether boom, which, in turn, is connected to moorings. Oil carried over the barrier face by waves is trapped in the cells as is oil carried under the barrier face by current flow.

3,703,085
SHEET PILE SECTION

Alfred Wogerbauer, Linz, Austria, assignor to Vereinigte Osterreichische Eisenund Stahlwerke Aktiengesellschaft, Linz, Austria

Filed Feb. 26, 1971, Ser. No. 119,287
Claims priority, application Austria, March 4, 1970, 2002
Int. Cl. E02d *5/04, 5/08*
U.S. Cl. 61—60 **9 Claims**

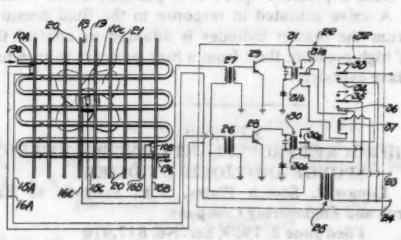


The invention relates to a sheet pile section for erecting partly or continuously double-walled sheet piles comprising a web and two flanges welded to said web and projecting on either side of said web, each flange-end being designed as one half of a connecting lock for interlocking with an adjacent section, wherein the improvement resides in that the flanges are provided with the same wall thickness over their total extension and with hook-shaped ends which are formed by cold roll bending and bent back towards the web. This section, the web width of which may be freely chosen, is capable of absorbing great axial forces and bending moments. Also, it is capable of exercising high resistance moments with respect to its weight.

3,703,086
TEMPERATURE-REGULATING SYSTEM IN APPARATUSES FOR MAINTAINING TEMPERATURE CONSTANT

Kiyoichi Nijo, Osaka, Japan, assignor to Naniwa Sangyo Co., Ltd., Osaka, Japan

Filed Feb. 11, 1971, Ser. No. 114,534
Claims priority, application Japan, March 11, 1970, 45/21135; Aug. 5, 1970, 45/68904
Int. Cl. F25b *41/00*
U.S. Cl. 62—209 **6 Claims**



A temperature-regulating system in apparatuses for maintaining temperature constant such as domestic refrigerators, usual refrigerators, heating apparatuses for living rooms, air

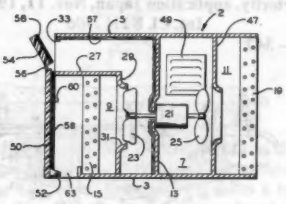
conditioning apparatuses or the like wherein a heat-exchanger regulating apparatus or machine is initiated and stopped differentially at the points of time when a first temperature-detecting device attached to a heat-exchanger detects a first predetermined temperature and when any one of a second temperature-detecting device provided outside said heat-exchanger detects a second or third predetermined temperature so as to maintain a desired constant temperature. Changes in the atmospheric temperature is compensated well owing to the presence of said third temperature-detecting device whereby said desired constant temperature is always maintained automatically.

3,703,087

SELF-CONTAINED AIR CONDITIONING UNIT

David E. MacLeod, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sept. 8, 1971, Ser. No. 178,573
Int. Cl. F25d *23/12*
U.S. Cl. 62—262 **3 Claims**



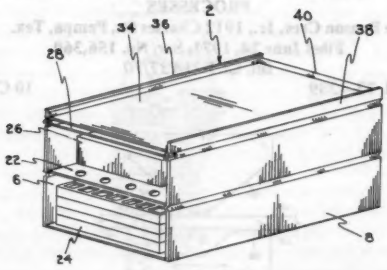
A self-contained air conditioning unit having a first panel pivotally mounted on the unit casing opposite the evaporator and a second panel pivotally mounted on the first panel opposite the conditioned air discharge opening; the second panel is adapted for movement relative to the first panel to control the direction of air discharged from the unit, the first and second panels being adapted for pivotal movement relative to the casing for access to the interior of the casing for servicing the air conditioning unit.

3,703,088

CONTAINER FOR HANDLING CHILLED PRODUCT

Glenn E. Moorhead, 3550 North Lakeshore Drive, Chicago, Ill.

Filed March 31, 1971, Ser. No. 129,753
Int. Cl. F25d *11/00*
U.S. Cl. 62—430 **10 Claims**



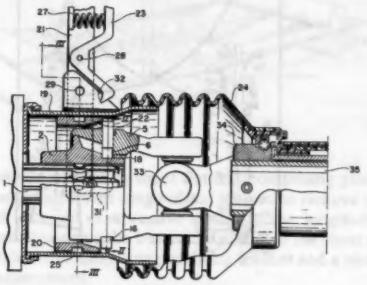
A combination refrigerated storage cabinet and dispensing plate for maintaining table fats, such as butter patties, at cold but spreadable temperatures over extended periods of time. The apparatus includes a refrigerant unit, a storage compartment, and an easy-access dispensing plate which enables rapid removal of individual servings of the refrigerated table fats.

3,703,089

DETACHABLE COUPLING DEVICE FOR TORQUE TRANSMITTING SHAFTS

Hubert Geisthoff, Rheinl; Hans-Heinrich Welschof, Obertshausen, and Hubert Grosse-Entrup, Rheinl, all of Germany, assignors to Firma Jean Walterscheid K.G., Lohmar, Germany

Filed July 12, 1971, Ser. No. 161,501
Claims priority, application Germany, July 18, 1970, P 20 35 788.4
Int. Cl. F16d *3/32*
U.S. Cl. 64—32 R **7 Claims**



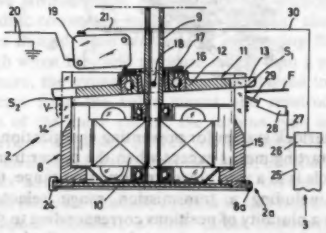
A coupling device comprises a conical coupling element on one shaft which is inserted into a tapered opening in the end of a yoke element extending from a universal joint connected to another shaft. The outer surface of the conical element has an annular groove in which are positioned two semi-circular blocking members pivotally mounted on the open end of the yoke element and having bent ends extending outwardly through openings in the yoke element. Spring means urge the blocking members inwardly into the groove to retain the coupling elements in driving relationship. A protective housing surrounding the conical coupling element has a lever pivotally mounted thereon which is operatively connected to a cylindrical slide element having an inner conical surface engageable with the projecting ends of the blocking members to release the blocking members from locking engagement with the conical coupling element.

3,703,090

COMBINED THREAD-FEEDING AND LUBRICATING DEVICE FOR KNITTING MACHINES

Karl Isac Joel Rosen, Villa Haga, Ulrichehamn, Sweden

Filed July 20, 1970, Ser. No. 56,385
Claims priority, application Germany, July 21, 1969, P 19 37 058.2
Int. Cl. D04b *15/48, 27/10*
U.S. Cl. 66—132 R **6 Claims**



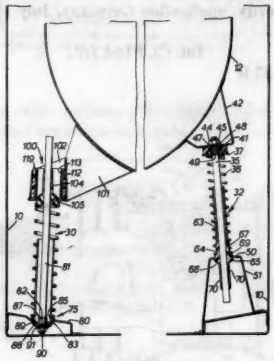
A thread lubricating device for use with a knitting or other textile machine. Thread is withdrawn from a supply spool and fed tangentially onto a drum. Means are provided for moving said thread axially along said drum from one end thereof to the other. Lubricant is applied to the surface of said drum and absorbed therefrom by the thread. After leaving said drum, said thread is then conducted to appropriate utilizing means.

3,703,091

CENTRIFUGAL EXTRACTION MACHINES

Johathan Peter Steele, London, England, assignor to The Hoover Company, North Canton, Ohio

Filed March 18, 1971, Ser. No. 125,487
Int. Cl. D06f *23/02*; F16f *15/00*
U.S. Cl. 68—23.1 **17 Claims**



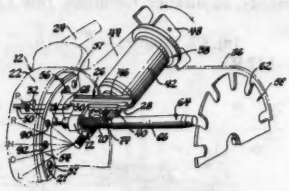
A centrifugal extraction machine is disclosed which incorporates a resiliently mounted assembly within which clothes are contained during washing. The assembly is supported by an outer casing entirely from below by a number of legs each incorporation a spring. There may be two or three such legs which may be connected to the casing or assembly by universal joints at one or other end. In at least one of the legs, the universal joint incorporates a friction damper bush split longitudinally of a supporting strut of the leg, and arranged so as to frictionally engage the leg and be forced thereagainst to cause frictional damping by compression of the spring during operation.

3,703,092

ENGINE STARTER AND POWER TRANSMISSION INTERLOCK SYSTEM

Harold V. Elliott, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed April 29, 1971, Ser. No. 138,481
Int. Cl. B60r *25/02*, *25/06*
U.S. Cl. 70—248 **3 Claims**



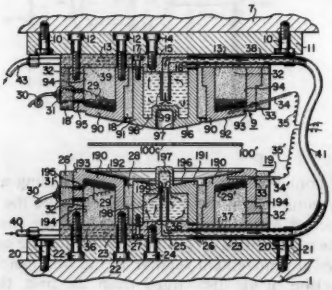
An interlock system for preventing energization of a vehicle engine starting motor except when the power transmission of the vehicle is in a zero power transmission range, the interlock system including a transmission range selector movable between a plurality of positions corresponding to the ranges of the transmission, a control member operatively connected to the vehicle ignition switch and movable between a plurality of positions corresponding to the various operative configurations of the ignition switch, a probe attached to the control member for bodily movement as a unit therewith and for limited universal movement relative thereto, and a keeper supported on the range selector for unitary movement therewith and having an aperture therein for reception of the probe. When the transmission is in a power transmitting range, the keeper is disposed across the path of motion of the probe to arrest movement of the control member before the ignition switch energizes the engine starting motor and when the transmission is in a zero power transmission range, the aperture is aligned with the probe so that movement of the control member is unimpeded. The limited universal movement capability of the probe effectively prevents the development of friction between the keeper and the probe so that there is no tendency of the latter to bind or stick in the aperture.

3,703,093

PROCESS AND APPARATUS FOR PERFORMING A SIMULTANEOUS AND COMBINED PRESS-FORMING AND HEAT-TREATMENT OF STEEL STOCK

Noboru Komatsu; Takatoshi Suzuki; Takuo Ito, all of Nagoya; Yoshiteru Hara, and Koulchi Asakura, both of Kariya, all of Japan, assignors to Aisin Seiki Kabushika Kaisha, Kariya and Kabushiki Kaisha Toyota Chuo Kenkyusho, Hisakata, Showa-ku, Nagoya-shi, Aichi-ken, Japan

Filed Nov. 10, 1970, Ser. No. 88,352
Claims priority, application Japan, Nov. 11, 1969, 44/90597
Int. Cl. B21j *1/06*
U.S. Cl. 72—342 **4 Claims**



The invention relates to a process for press-forming and heat-treating a metallic stock for the manufacture of a specifically shaped product having locally different hardness distributions in specifically selected patterns.

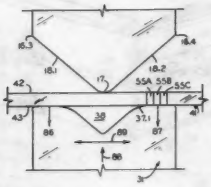
The forming and heating are performed in a simultaneous operation of the die press machine, whereby the stock is deprived of different amounts of heat at different temperatures in specifically localized zones.

3,703,094

BRAKE PRESS DIE SYSTEM, STRUCTURE AND PROCESSES

George Benson Cree, Jr., 1912 Charles St., Pampa, Tex.

Filed June 24, 1971, Ser. No. 156,360
Int. Cl. B21d *37/10*
U.S. Cl. 72—389 **10 Claims**



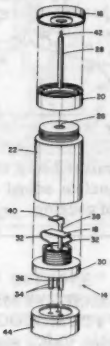
Structures are provided each having a high modulus of resilience as well as improved metallurgical gradients and physical characteristics and resulting sufficient resilience to avoid damage by impact stresses, while sufficiently hard and mechanically stable to maintain their dimensional stability.

3,703,095

APPLANATION TONOMETER

Harry F. Holcomb, and Miguel Martinez, both of Baltimore, Md., assignors to The Johns Hopkins University

Filed March 10, 1970, Ser. No. 18,182
Int. Cl. A61b 3/16
U.S. Cl. 73—80 10 Claims



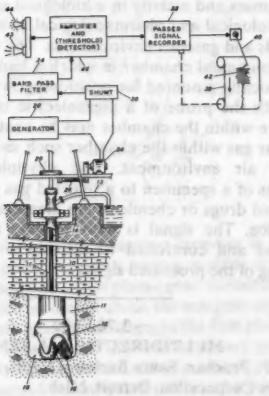
An electric applanation type tonometer of the all solid state type is provided. A signal null indicative of a desired applanation triggers an electronic switch which takes a reading of a pressure signal. This pressure signal is stored and read out for several minutes after removal of the instrument from the eye.

3,703,096

METHOD OF DETERMINING DOWNHOLE OCCURRENCES IN WELL DRILLING USING ROTARY TORQUE OSCILLATION MEASUREMENTS

Albert L. Vitter, Jr., New Orleans, and Hugh G. McDonald, Monroe, both of La., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 28, 1970, Ser. No. 101,739
Int. Cl. E21b 47/00
U.S. Cl. 73—151 10 Claims



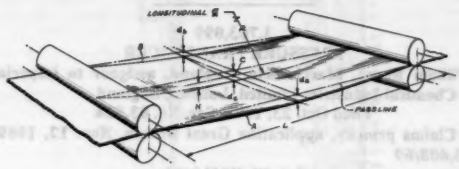
Method and apparatus are used to detect and measure oscillations of the rotary torque generated while well drilling, particularly oscillations of a frequency near the expected frequency of torsional oscillation of the drill string. The method and apparatus are particularly useful in indicating bit damage.

3,703,097

METHOD AND SYSTEM FOR MEASURING SHEET FLATNESS

Stanley A. Kilpatrich, Spokane, Wash., and Woodard A. Niethammer, Pleasanton, Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Dec. 24, 1970, Ser. No. 101,242
Int. Cl. G01l 33/20
U.S. Cl. 73—159 24 Claims



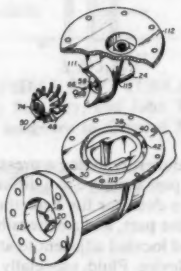
A process for measuring sheet flatness comprising placing the sheet under sufficient longitudinal tension to remove substantially all internal compressive strains in the longitudinal direction and measuring the transverse profile of the sheet surface by suitable noncontacting proximity sensors and a system for such measurement.

3,703,098

COMPOUND FLUID METER

Narinder Masson, 135 Montgomery Street, Jersey City, N.J.; William John Korenicki, 6 Mill Court, Linden, N.J., and Walter Ludwig Lechner, 21 Mee Lane, New Providence, N.J.

Filed May 10, 1971, Ser. No. 142,046
Int. Cl. G01f 1/00
U.S. Cl. 73—231 R 1 Claim



A compound fluid meter including a turbine type high flow metering device disposed in a main metering conduit, a low flow positive displacement metering device disposed in a bypass conduit connected to the main conduit, changeover valve means in said main conduit for preventing fluid flow therethrough when the fluid pressure is less than a predetermined pressure, the bypass conduit being adapted to receive fluid upstream from the valve means and reintroduced it downstream of the valve means, the turbine type high flow metering device comprising a fixed rod-like support member upon which an impeller is rotatably mounted, the rod-like support member having a free end extending towards the upstream end of the main conduit, a recess in said free end of the rod-like support member, a first thrust member loosely disposed in the recess and extending therefrom toward the upstream end of the main conduit, a ball-shaped thrust member, and a recess in the hub of the impeller shaped to receive at least the free end of the rod-like support member with the first thrust member extending therefrom and the ball-shaped thrust member disposed between the upstream end of the hub recess and the first thrust member. Holes may be provided in the impeller for introducing the fluid being metered into the hub

recess to lubricate and cool the relatively rotating elements therein. Further, face polarized annular permanent magnets are provided for coupling the impeller to an intermediate gear train and the intermediate gear train to the gearing of a register box to permit the intermediate gear train to be disposed in a fluid tight casing. Still further, the changeover valve means may comprise a toggle link mounted valve member having a cam follower adapted to cooperate with a cam for guiding the valve member through its opening and closing movements

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3,703,099

PRESSURE TRANSDUCER

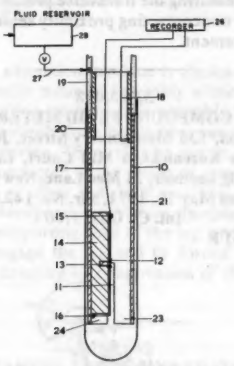
William Rouse, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 23, 1970, Ser. No. 83,524

Claims priority, application Great Britain, Nov. 12, 1969, 53,408/69

Int. Cl. G01l 9/06

U.S. Cl. 73—398 AR **6 Claims**



A pressure transducer including a pressure sensitive device having at least one part sensitive to a difference in pressure on each side thereof, a detector for detecting flexural strain induced in the sensitive part, and a distensible envelope providing a closure for and located adjacent to and unsecured to said pressure sensitive device. Fluid, especially gas, pressure is supplied to the interior of the envelope via fluid access means to distend and isolate the pressure sensitive device and render it unresponsive to any external pressure thus enabling a "zero reading" to be determined by equalizing the pressure on each side of said pressure sensitive device.

3,703,100

INSPECTING SYSTEM WITH A BRANCH CHUTE FOR SAMPLING FINISHED WORKPIECES

Makoto Kikuchi, Kariya, and Isao Suzuki, Okazaki, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

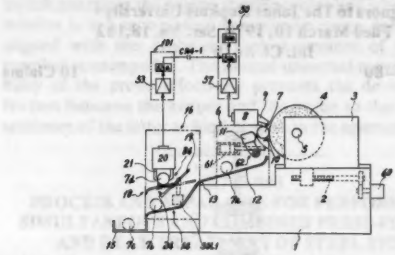
Filed Aug. 13, 1971, Ser. No. 171,613

Claims priority, application Japan, Aug. 25, 1970, 45/74036

Int. Cl. G01n 1/02

U.S. Cl. 73—423 **7 Claims**

In a post-process control system of gauging, a finished workpiece is led by a shutter from a delivery chute to an inspecting station placed in a branch chute each time a predetermined number of workpieces have been machined. At the inspecting station, the finished workpiece is clamped by a clamping



device and in turn is measured by a sizing device for generating a compensating signal to adjust a signal unit of the in-process control system of gauging.

3,703,101

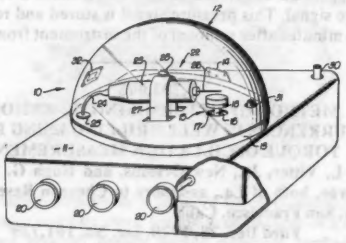
APPARATUS FOR SENSITIVE MEASUREMENT AND RECORDING OF PHYSIOLOGICAL ACTIVITY

Roy J. Pence, Los Angeles, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 14, 1970, Ser. No. 97,617

Int. Cl. A61b 10/00

U.S. Cl. 73—432 R **3 Claims**



An apparatus for sensitive measurement and recording of the responses and activity in a biological specimen useful for the toxicological and pharmacological investigation of drugs, chemicals and gaseous environments. The apparatus includes an environmental chamber in which a biological specimen is stereotaxically mounted for positioning in selectable engagement with the probe of a piezoelectric transducer. The atmosphere within the chamber may be controlled to provide a particular gas within the chamber such as a contaminated or polluted air environment. The physiological activity or responses of a specimen to a selected gas or to manually administered drugs or chemicals are measured by the transducing device. The signal is then suitably amplified, filtered, processed and controlled to provide a visual or auditory recording of the processed signal.

3,703,102

MULTIDIRECTIONAL SENSOR

Otakar P. Prachar, Santa Barbara, Calif., assignor to General Motors Corporation, Detroit, Mich.

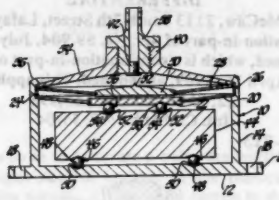
Filed Sept. 8, 1970, Ser. No. 70,319

Int. Cl. G01p 15/02

U.S. Cl. 73—514 **3 Claims**

A cylindrical seismic mass includes three equally circumferentially spaced conical depressions in its lower end wall which receive and seat a first set of balls seating in like mating depressions in a plate supported on the lower wall of a cylindrical housing. The upper end wall of the mass contains three

equally circumferentially spaced conical depressions which seat a second set of balls also seating in an overlying first plate having like depressions mating with those of the mass. An overcenter disc spring supports the plate in engaged position with the second set of balls to in turn hold the mass in engagement with the first set of balls and locate the mass against movement laterally of the lower wall of the housing. An operator plate is supported adjacent the first plate by a disc spring in spaced relationship to a primer. When the mass receives an acceleration pulse of predetermined amplitude and time, it



shifts generally parallel to the lower wall of the housing and the camming action of the first set of balls moves the mass axially or raises the mass. This movement of the mass and the camming action of the second set of balls axially shifts the first plate so that the disc spring thereof moves overcenter. The first plate then engages the operator plate to shift the operator plate axially so that the operator disc spring moves overcenter and the operator plate engages the primer. A modification includes a second plate supported by an overcenter disc spring between the first plate and operator plate.

3,703,103

MECHANISM FOR PRODUCING RECTILINEAR MOTION

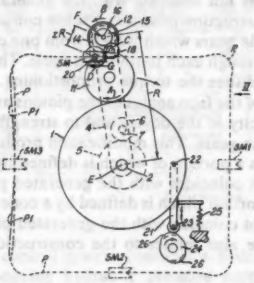
Robert William Davies, London, England, assignor to Molins Limited, London, England

Filed Feb. 4, 1971, Ser. No. 112,740

Claims priority, application Great Britain, Feb. 9, 1970, 6,033/70

Int. Cl. F16h *35/16*

U.S. Cl. 74—86 **4 Claims**



A mechanism for moving a support member in a substantially rectilinear polygonal path having *n* sides comprises a first sun gear engaged by a first planet gear, mounted on a first planet carrier which is rotated about the sun gear and also carries a second planet gear which engages the first planet gear; a second sun gear coaxial with the second planet gear is nonrotatably fixed to the first planet carrier; a second planet carrier, fixed to the second planet gear, and on which is rotatably mounted a third planet gear in engagement with the second sun gear and a fourth planet gear engaging the third planet gear, the support member being fixed to the fourth planet gear; the rectilinearity of the polygonal path is improved by rotating the first sun gear to and fro cyclically in synchronism with the rotation of the first planet carrier so that *n* cycles of movement of the first sun gear take place during each revolution of the first planet carrier.

3,703,104

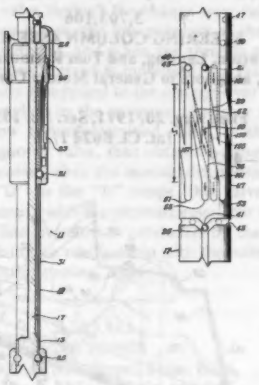
POSITIONING APPARATUS EMPLOYING DRIVING AND DRIVEN SLOTS RELATIVE THREE BODY MOTION

Jack W. Tamplen, Rural Route 2, Celina, Tex.

Filed Dec. 21, 1970, Ser. No. 99,763

Int. Cl. F16h *27/02*

U.S. Cl. 74—88 **19 Claims**



Positioning apparatus for effecting movement of a first body with respect to a second body in response to movement of a third body characterized by a slot traversal member engaging a set of driving slots and a set of driven slots that are formed respectively in the first and second bodies. One of the sets of driven and driving slots comprises a closed pattern of slots; and the other comprises a single slot having at least two portions that have the same design and are movable so as to be coextensive with the slots of the closed pattern of slots. Also disclosed are tubular and planar constructions employing the driving and driven slots.

3,703,105

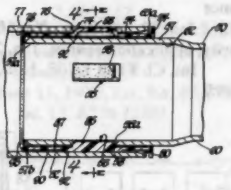
COLLAPSIBLE SHIFT TUBE ASEMBLY

Thomas J. Milton, Bay City, and John W. Skelley, Saginaw, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 20, 1971, Ser. No. 173,411

Int. Cl. B62d *1/18*

U.S. Cl. 74—492 **3 Claims**



In a preferred form, this disclosure relates to a collapsible shift tube assembly having a cylindrical upper member, a cylindrical lower member, and a locking sleeve. The upper member which is received within the lower member has a plurality of circumferentially spaced slots in its lower end portion, and the lower member has a plurality of circumferentially spaced slots in its upper end portion. The sleeve is located intermediate of the upper and lower members and has radially inwardly and outwardly extending projections which are received within the slots of the upper and lower members respectively for joining the lower members to normally prevent relative angular movement therebetween. The joining means also has a radially extending flange means which is

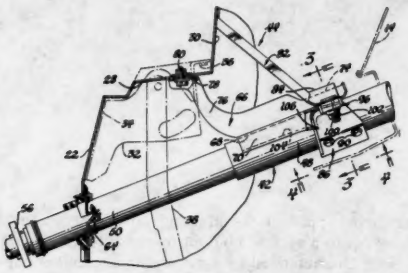
cooperable with the lower end of the upper member and the upper end of the lower member for normally preventing axially inward collapse of the shift tube assembly and which is shearable upon a predetermined axial load of the shift tube assembly to allow the shift tube assembly to collapse axially inward.

3,703,106

STEERING COLUMN ASSEMBLY

Gary L. Arntson, Lansing, and Tom Rasmussen, Okemos, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 20, 1971, Ser. No. 173,489
Int. Cl. B62d *1/18*
U.S. Cl. 74—492 **5 Claims**



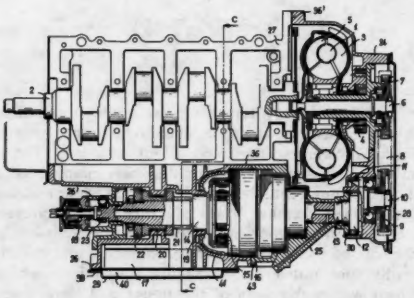
An energy absorbing steering column assembly for an automotive vehicle, the steering column assembly including a collapsible column structure and a combination support and guide member rigidly attached to the vehicle body remote from the instrument panel structure thereof and defining a channel of decreasing depth adapted to slidably receive a pair of lugs on a bracket rigidly attached to the column structure and axially movable therewith during energy absorbing collapse. During collapse of the column structure the bracket is constrained by the combination member to move in a path of motion effecting optimum performance while the lugs are progressively more tightly wedged in the combination member to effect supplementary energy absorption.

3,703,107

AUTOMOTIVE TRANSVERSE-MOUNTED POWER UNITS

Jean Piret, Billancourt, France, assignor to Regie National des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of France

Filed Jan. 22, 1971, Ser. No. 108,729
Claims priority, application France, Jan. 26, 1970, 7002586
Int. Cl. F16h *37/08*, *57/02*
U.S. Cl. 74—695 **8 Claims**



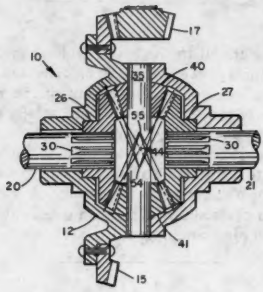
A power unit mounted across the longitudinal axis of a motor vehicle comprises a torque converter casing, a main transmission mechanism and differential gear casing connected to the power unit along orthogonal assembling planes and centered to one another by means of a cylindrical fitting. A detachable casing section assembled on the one hand to the main casing of the transmission mechanism along an assembling plane perpendicular to the assembling plane of the power unit crankcase and on the other hand to the torque converter casing is provided.

3,703,108

DIFFERENTIAL

Thomas M. McCaw, 2113 South 7th Street, Lafayette, Ind.

Continuation-in-part of Ser. No. 59,904, July 31, 1970, abandoned, which is a continuation-in-part of Ser. No. 816,741, April 16, 1969, abandoned. This application April 12, 1971, Ser. No. 133,195
Int. Cl. F16h *1/40*, *55/04*
U.S. Cl. 74—713 **35 Claims**



A torque proportioning differential is disclosed for use in a vehicle which enables distribution of torque to each drive wheel to match traction conditions at each wheel so that maximum available tractive effort to drive the vehicle is obtained. This is accomplished by the use of bevel gears for the pinions and side gears of either the straight, Zerol (Registered Trademark) or spiral type. These gears are formed so that the face cone apex does not coincide with the generated pitch cone apex. This construction produces a tooth contact between the pinions and side gears which travels from one end of the teeth to the other through each tooth mesh cycle. This contact condition accomplishes the torque proportioning. Also shown is modification of the face angles of the pinions and side gears to increase capacity of the device and to strengthen the ends of the teeth of the gears. This modification produces compound face structures a portion of which is defined by a cone having an apex which coincides with the generated pitch cone apex and another portion which is defined by a cone having an apex which does not coincide with the generated pitch cone apex. The disclosure also relates to the construction of the bevel gears.

3,703,109

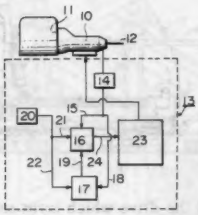
ELECTRONIC CONTROL DEVICE FOR AUTOMATIC POWER TRANSMISSION MECHANISM

Namio Irie, and Masanori Mizote, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sept. 29, 1970, Ser. No. 76,458
Claims priority, application Japan, Oct. 1, 1969, 44/78362
Int. Cl. B60k *21/00*; F16h *47/00*, *5/42*
U.S. Cl. 74—866 **4 Claims**

An electronic control device for an automatic power transmission mechanism that serves to effect smooth down shift by setting a neutral interval in accordance with vehicle speed and engine torque. In the control device, a first sensor electronically detects the vehicle speed and a second sensor detects the engine torque. A speed range indicating circuit receives out-

put signals of the first and second sensors to generate a plurality of signals each indicating that the vehicle is running at a particular speed associated with the signal. A neutral interval adjustment circuit is provided to respond to the outputs of the first and second sensors and the plurality of speed range in-



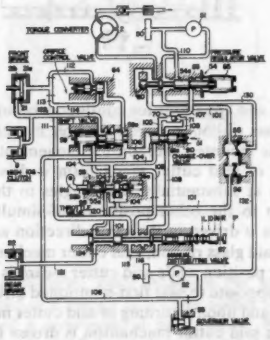
dicating signals so as to generate a pulse the width of which is equal to a proper neutral interval at the particular vehicle speed and engine torque. A command circuit is also provided to operate to hold the automatic power transmission mechanism in a neutral position for the duration of the pulse.

3,703,110

HYDRAULIC CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION

Sumio Uozumi; Ichio Sakai, and Kiyoshi Ohnuma, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Japan

Filed Jan. 26, 1971, Ser. No. 109,786
Claims priority, application Japan, Jan. 28, 1970, 45/7629
Int. Cl. B60k *21/00*; F16h *3/74*
U.S. Cl. 74—868 **5 Claims**



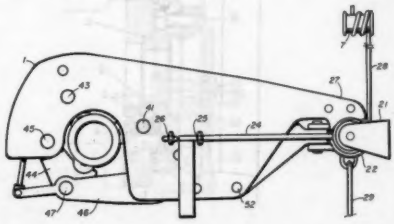
A hydraulic control system contains a hydraulic pressure source for producing hydraulic pressure supplied into the hydraulic servo mechanisms of a hydraulic automatic transmission, the hydraulic pressure is conveyed through a conduit system to a manual distributing valve which distributes the hydraulic pressure in accordance with its position in the various ranges "P", "R", "N", "D" and "L", a pressure regulator valve is located in the conduit system for establishing a line pressure by regulating the hydraulic pressure from the hydraulic pressure source, a governor valve in communication with a change-over valve and with a shift valve provides a governor pressure conforming to the vehicle speed, and a throttle valve is located in the conduit system for obtaining a throttle pressure conforming to the engine throttle opening. The shift valve supplies the line pressure to the required servo mechanism by comparing the governor pressure and the throttle pressure, and the change-over valve supplies the throttle pressure to the pressure regulator valve in accordance with the governor pressure. When the manual distributing valve is in the "R" range and the engine throttle opening is extremely small, the line pressure from the manual distributing valve is discharged and controlled in the throttle valve to take out a relatively low throttle pressure. When the throttle opening exceeds a predetermined value, the throttle valve takes out the line pressure from the pressure regulator valve as it is, thus obtaining a constant high throttle pressure. When the manual distributing valve is in the "D" range, the throttle pressure is applied to the pressure regulator valve through the change-over valve. When the throttle pressure is low, the line pressure of the pressure regulator valve is reduced, and when the throttle pressure is high, the line pressure thereof is increased. Furthermore, as the governor pressure is supplied to the change-over valve, the throttle pressure applied to the pressure regulator valve at a vehicle speed below a predetermined value, is shut off by means of the changeover valve, thus obtaining a constant low line pressure. Moreover, when the manual distributing valve is shifted from the "D" to the "L" range, this valve communicates the line pressure with the pressure regulator valve and, therefore, a high line pressure is produced by the pressure regulator valve, having no relationship with the vehicle speed and the engine throttle opening.

3,703,111

PIPE TONGS

William Guier, 3100 East 71st Street, Tulsa, Okla.

Filed Jan. 8, 1971, Ser. No. 104,865
Int. Cl. B25b *13/50*
U.S. Cl. 81—57.34 **7 Claims**



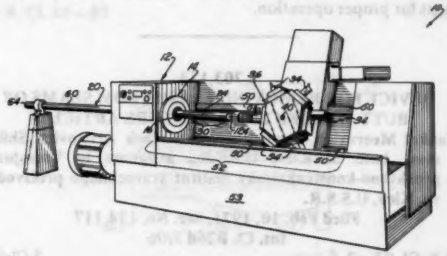
A pair of tongs are suspended above the rotary table of an oil well, their jaws aligned to grip pipe which is screwed together, or unscrewed, in sections. The jaws of the tongs are actuated by a fluid-powered mechanism to obviate manual manipulation. The tongs are mounted and arranged so they may be swung with the pipe sections and kelly between a rotary table and a mousehole.

3,703,112

MACHINE TOOL WITH BAR FEED CONTROL

Jack H. Selby, Chagrin Falls, Ohio, assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed June 11, 1970, Ser. No. 45,476
Int. Cl. B23b *13/02*
U.S. Cl. 82—2.5 **30 Claims**



An improved machine tool for operating on bar stock includes a chuck for holding the bar stock with a leading end

portion extending toward a work station and a trailing end portion extending in a direction away from the work station. Bar stock is fed from the chuck to the work station by a gripper assembly which pulls the bar stock out of the chuck. As the bar stock is fed to the work station, a signal generator provides signals representative of changes in the length of the trailing end portion of bar stock. To insure that sufficient bar stock is left in the chuck for proper holding during operation of the machine in response to signals from the signal generator indicating that the trailing end portion of the bar stock is shorter than a predetermined length. The numerical control system is activated by a bar end detector when the trailing end surface of the bar stock is in a predetermined location and a known length of bar stock is available for feeding to the work station.

3,703,113

QUICK-CHANGE DEVICE FOR CLAMPING APPARATUS ON TURNING MACHINES

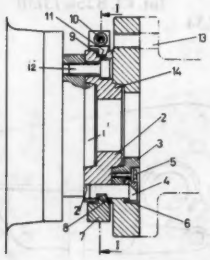
Armin Feisel, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed June 18, 1971, Ser. No. 154,478

Claims priority, application Switzerland, July 16, 1970, 10813/70

Int. Cl. B23b *19/02*

U.S. Cl. 82—30 **7 Claims**



A quick change clamping device for mills, lathes or other turning machines in which a first clamping flange is fixedly attached to, or formed on, the hub of the machine, the first flange being provided with axially extending parallel holes. A second flange of annular configuration is provided with a plurality of axially extending clamping pins which are capable of gripping the second flange, extending into the holes of the first flange, and which are notched to receive a clamping ring. The clamping ring surrounds the first flange and extends inwardly therethrough. Angularly spaced openings permit the clamping pins to be inserted after which the clamping ring is rotated, operating against camming surfaces to pull the second plate firmly against the first, whereupon the clamping ring is tightened by one or more clamping bolts mounted therein. The apparatus is advantageous in that it can be operated rapidly and requires very little time and substantially no alignment for proper operation.

3,703,114

DEVICE FOR REMOVING FLASH FROM SEAMS OF BUTT-WELDED LONG-MEASURE ARTICLES

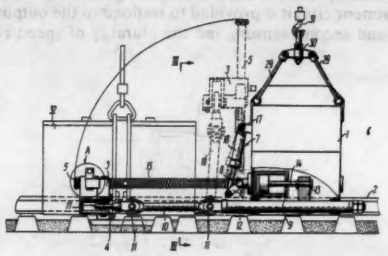
Yankel Meerovich Topopolsky, and Mark Aronovich Shikhman, both of Kiev, U.S.S.R., assignors to Vsesojuzny proekthno-konstruktorsky institut svarochnogo proizvodstva, Kiev, U.S.S.R.

Filed Feb. 10, 1971, Ser. No. 114,117

Int. Cl. B26d *3/06*

U.S. Cl. 83—3 **3 Claims**

The claimed device for removing flash from the seams of butt-welded long-measure articles includes a casing carrying a head with opening cutters, said head being installed with a provision for being moved progressively by its drive on a lever one end of which is articulated at the base of the casing and



connected with the drive which turns said lever in a vertical plane for bringing the lever with the head to a working position parallel to the article.

3,703,115

AUTOMATIC GLASS RIBBON CUTTING PROCESS AND APPARATUS

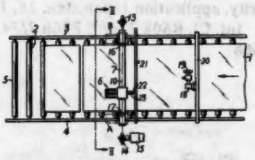
Yasuyuki Nagae, 40-12 Ohmino, and Nobuyuki Yamashita, 2095 Miyaziono-cho Sanban, both of Sakai, Japan

Filed Sept. 8, 1970, Ser. No. 70,214

Claims priority, application Japan, Sept. 10, 1969, 44/71271

Int. Cl. B26d *3/08*

U.S. Cl. 83—12 **10 Claims**



A process and apparatus for continuously cutting or scoring a moving glass ribbon in which a cutter mechanism having a cutter means mounted thereon for movement with and also transversely of said cutter mechanism is driven across said glass ribbon at substantially right angles to the ribbon from one position to the other position and simultaneously, said cutter means is driven in the same direction and at the same velocity as said glass ribbon, said cutter mechanism is retained in said other position while said cutter means is being driven in a direction opposite to said first-mentioned direction to its initial position and upon returning of said cutter means to said initial position said cutter mechanism is driven from said other position to said one position and simultaneously.

3,703,116

METHOD AND APPARATUS FOR SLITTING SHEET MATERIAL

Brendan L. Doll, Patterson, N.C., assignor to Cellu Products Company, Patterson, N.C.

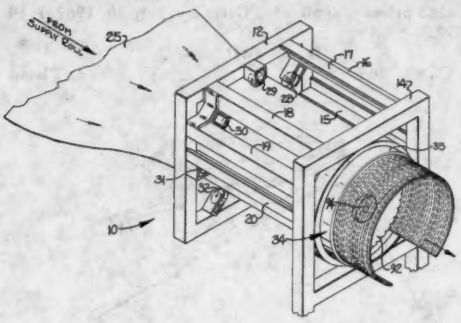
Filed Dec. 1, 1970, Ser. No. 94,118

Int. Cl. B65h *17/20*

U.S. Cl. 83—17 **16 Claims**

A method and apparatus for slitting flexible sheet material of indeterminate length wherein the material is advanced along a predetermined path of travel to and past a slitting station, is formed into a transversely curved configuration as it is advanced, and is slit at the slitting station in a predetermined pattern of spaced, transversely extending rows of spaced slits with the slits in adjacent rows being in predetermined staggered relation. The apparatus includes a circular rotary knife

and means for traversing the knife transversely of the curved sheet material. The periphery of the knife blade includes a plurality of spaced cutting edges adapted to penetrate the sheet material to form transverse rows of slits as the material is advanced through the apparatus.

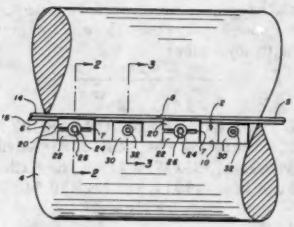


3,703,117

ROTARY PAPER-CUTTER KNIFE STRUCTURE

Merton Louis Matthews, Westerly, R.I., assignor to Maxson Automatic Machinery Company, Westerly, R.I.

Filed Dec. 1, 1970, Ser. No. 93,978
Int. Cl. B23d *25/12*
U.S. Cl. 83—677 6 Claims



A rotary paper-cutter knife structure the knife blade of which is secured in a trough of a knife holder in the form of the revolver of a conventional paper-cutter machine. The knife is radially adjustable by means of a pusher having a ledge contacting the heel surface of the knife and having screw means extending therethrough and engaging the bottom surface of the trough. The knife blade is releasably clamped in the trough by means of wedges.

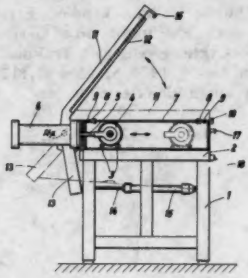
3,703,118

PUNCHING APPARATUS

Ernst Maximilian Spengler, Heusenstamm near Offenbach am Main, Germany, assignor to Roeder & Spengler OHG, Bergen-Enkheim, Germany

Filed April 27, 1970, Ser. No. 32,294
Claims priority, application Germany, May 7, 1969, G 69 18 475.4; April 4, 1970, P 20 16 182.4
Int. Cl. B26d *5/08*; B26f *1/42*
U.S. Cl. 83—542 6 Claims

The present punching apparatus is a so called clicking machine for producing shapes out of sheet material by means of punching tools. A punching table made of bendable material is pressed toward the punching tools by a presser cylinder as the cylinder is moved in contact with and along one surface of the bendable punching table while pressure is exerted against



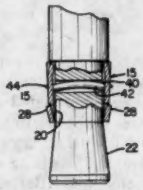
the opposite punching table surface by counter presser means through said tools and through said sheet material to be punched.

3,703,119

EXPANSION BOLT

Lester Lerich, 1120 Birdie Place, Broomfield, Colo.

Division of Ser. No. 543,857, April 20, 1966, abandoned. This application Sept. 14, 1970, Ser. No. 72,087
Int. Cl. F16b *13/06*
U.S. Cl. 85—67 5 Claims



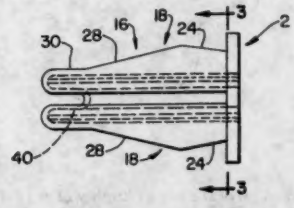
An expansion bolt of the type provided with collar-like wedge members disposed in an annular recess on the external surface of the bolt shank which are automatically movable into anchoring engagement with the wall of the bolt hole under the urging of a resilient insert extending transversely through the bolt shank behind the wedges in further cooperation with outwardly directed projections on the wedge members.

3,703,120

PLASTIC NUT DEVICE WITH IMPROVED SCREW SEALING AND INSULATING MEANS

Harold S. Van Buren, Jr., Lexington, Mass., assignor to TRW Inc., Cleveland, Ohio

Filed Oct. 22, 1970, Ser. No. 82,922
Int. Cl. F16b *13/04*, *19/00*
U.S. Cl. 85—83 6 Claims



A one-piece plastic nut device having an integral web for effecting a seal about a screw turned into the nut.

3,703,121

CONTROL ELEMENT TO BE IGNITED ELECTRICALLY FOR PIN ENTRANCE

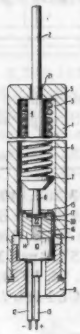
Heinz Gawlick, Furth; Hellmut Bendler, Erlange-Spardorf, and Gunter Hubsch, Kalchreuth, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Nov. 5, 1970, Ser. No. 87,112

Claims priority, application Germany, Nov. 5, 1969, P 19 55 703.0

Int. Cl. F42c *19/12*

U.S. Cl. 89—1 B 22 Claims



A control element to be electrically ignited for pin retraction, wherein the pin is guided in a housing in which the electrical primer element is accommodated and is optionally provided with a delay device. In the starting position, a compression spring presses the pin with an integrally attached piston against the primer element. The piston rests on a supporting element of the primer element. After ignition of the primer element, the compression spring presses the pin with a residual force against the remaining portion of the supporting element which has been penetrated.

3,703,122

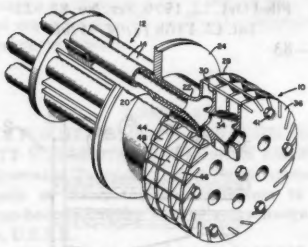
MUZZLE BRAKE TORQUE ASSIST FOR MULTI-BARREL WEAPONS

Dale A. Farrington, Winooski, and George E. Vandevord, South Burlington, both of Vt., assignors to General Electric Company

Filed Dec. 10, 1970, Ser. No. 96,681

Int. Cl. F41f *17/12*

U.S. Cl. 89—14 C 2 Claims



A muzzle recoil brake has a plurality of gas deflection plates disposed downstream of the barrel muzzles for providing both a forward thrust and a rotary torque to the rotor from the gun gas exiting and expanding from the gun muzzles.

3,703,123

STAND FOR LIGHT FIREARMS

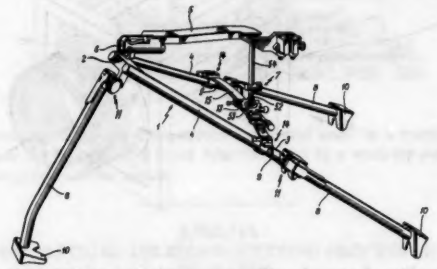
Kurt Horn, Oberndorf, Germany, assignor to Heckler & Koch GmbH, Oberndorf, Germany

Filed July 29, 1970, Ser. No. 59,057

Claims priority, application Germany, July 30, 1969, P 19 38 592.3

Int. Cl. F41f *21/04*

U.S. Cl. 89—40 E 15 Claims



A stand for light firearms is substantially in the form of a tripod and includes a firearm support one end of which is connected to the stand by means of a universal joint, and the other end of which is pivotally connected to one end of a vertical strut the other end of which is supported by a device which is slidable and detainable on a horizontally disposed guide of the stand to permit lateral aiming adjustment of the firearm support, the strut comprising a screw-threaded spindle and a sleeve in which it is longitudinally displaceable for adjusting the effective length of the strut, the sleeve supporting a screw-threaded jaw which embraces the spindle by less than 180° and which is disengageable therefrom for coarse length adjustment, and the spindle being rotatable while in mesh with the jaw for fine length adjustment.

3,703,124

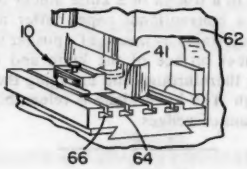
MACHINE TOOL GUARD AND/OR SAFETY SHIELD

William Smith, 6 North 654 Pine, R.R. 3, Bensenville, Ill., and Charles E. McGrath, 3552 West 115th Place, Chicago, Ill.

Filed June 7, 1971, Ser. No. 150,548

Int. Cl. B23c *9/00*

U.S. Cl. 90—11 R 11 Claims

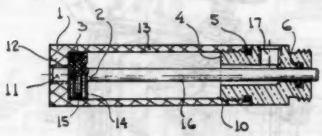


A machine tool guard and/or safety shield to protect the machine operator from flying chips, coolant liquids, such as oils, and other materials, and to provide protection from contact with the machine moving parts, wherein the device is readily attachable to a machine tool and is provided with a body having a slot for receiving a shield or protective guard removably secured thereto, and wherein the shield or guard is clamped by a plunger which is operated by a manual lever, and wherein the plunger is normally biased to retain the shield or guard, and wherein the plunger may be retracted by manual means to permit release of the guard or shield.

3,703,125
PLASTIC ACTUATING CYLINDER

Richard S. Pauliukonis, 6660 Greenbriar Drive, Cleveland, Ohio

Continuation of Ser. No. 883,152, Dec. 8, 1969, abandoned.
This application Aug. 5, 1971, Ser. No. 169,532
Int. Cl. F01b *11/02, 31/00;* F16j *1/00*
U.S. Cl. 92—85 3 Claims

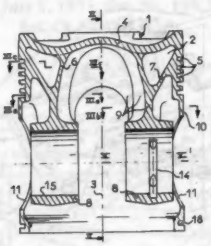


An all-plastic piston and cylinder assembly including an integrally molded end closure having a coaxial port therein and a threaded all-plastic closure member having a single annular groove and seal for the piston rod.

3,703,126
INTERNAL COMBUSTION ENGINE PISTON

Albert Haug, Montmorency, France, assignor to Societe d'Etudes de Machines Thermiques, Saint-Denis, France

Filed Feb. 1, 1971, Ser. No. 111,308
Claims priority, application France, Feb. 16, 1970, 7005425
Int. Cl. F01b *31/08*
U.S. Cl. 92—186 1 Claim



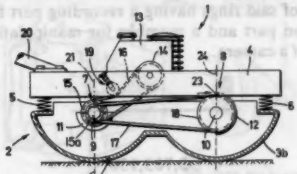
Modular cast iron piston for an internal combustion engine, with oil cooling of at least the head and some of the piston ring grooves, and comprising an annular cooling chamber located in the piston head in proximity at least to the groove of the first piston ring and corresponding in configuration to said piston head and promoting the transmission of thrust forces directly to the boss forming the bearing of the connecting-rod small end.

3,703,127
RIGID BASE EARTH COMPACTOR

Benno Kaltenegger, Kurhausstr. 77-79, 5202 Hennef, Germany

Filed Dec. 15, 1970, Ser. No. 98,328
Claims priority, application Germany, Jan. 17, 1970, P 20 01 987.8
Int. Cl. E01c *19/30*
U.S. Cl. 94—48 21 Claims

An earth compactor having a unitary base with downwardly facing convex surfaces. A first vibrator assembly is mounted generally centrally of one surface and a second vibrator assembly is mounted generally centrally of the second surface. Each assembly includes an eccentrically mounted weight. The weights are rotated at a speed ratio of 2:1 relative to each other and are initially positioned so both weights are up relative to the shafts on which they rotate. Such phasing of the weights provides an upwardly directed simultaneous unweighting action which facilitates steering and moving the machine by an operator. In one embodiment the weights have the same mass. The impacts exerted on the earth by this machine have a complex waveform, including a band of frequencies which provide for optimum compacting of earth

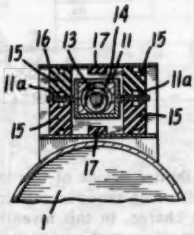


of various particle sizes and consistencies. In a second embodiment the slower rotating weight has a greater mass than the faster rotating weight. In another embodiment, the portion of the base associated with the slower rotating heavier weight is heavier than the portion of the base associated with the lighter faster rotating weight.

3,703,128
VIBRATING ROLLER

Johnny Fransson, Akersberga, Sweden, assignor to Aktiebolaget Vibro-Verken, Solna, Sweden

Filed Oct. 12, 1970, Ser. No. 79,824
Claims priority, application Sweden, Oct. 8, 1969, 13848
Int. Cl. E01c *19/28*
U.S. Cl. 94—50 V 17 Claims

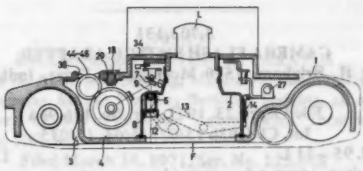


A vibrating roller mechanism that includes a roller drum and a vibrating device mounted on the drum to form a tuned two-mass system in resonance. This arrangement provides for a high amplitude of vibration of the roller drum with the use of a vibrating device of relatively small mass.

3,703,129
CAMERA PROVIDED WITH A RECORDING DEVICE FOR A PHOTOGRAPHED DATE

Takeshi Goshima, Tokyo, and Tooru Miyasaka, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed April 10, 1970, Ser. No. 27,285
Int. Cl. G03b *17/24*
U.S. Cl. 95—1.1 4 Claims



A camera provided with a recording device for a photographed date, comprising an auxiliary optical lens system com-

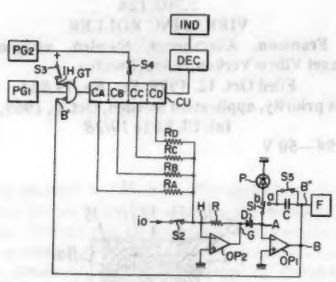
mon to day, month and year for making an image of a date onto film overlapping on a part of a picture from an outer object, three rings for date preselection, a middle one of said rings being supported coaxially and slidably arround an inner one of said rings and supporting a remaining outer one of said rings coaxially and slidably around said middle one of said rings, each of said rings having a recording part for date and an inspection part and a member for manipulation from an outer face of a camera.

3,703,130

ELECTRONIC SHUTTER CONTROL DEVICE

Asao Watanabe, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed March 23, 1971, Ser. No. 127,288
Claims priority, application Japan, April 6, 1970, 45/29184
Int. Cl. G03b 7/08, 9/58; H03k 17/00
U.S. Cl. 95—10 CT **10 Claims**



The electronic shutter device of this invention eliminates the prior art circuit which required extremely high insulation so as to hold the charge. In this invention, the current of photosensitive element proportional to the intensity of light of an object is converted into a voltage proportional to a logarithm of said current. Said voltage is compared with a voltage induced by a correction current for setting a film speed and a current of which magnitude being varied in response to a number of pulses counted by a binary counter. When the difference between these voltages reaches a predetermined value, the counter stops its counting. When the shutter is actuated a current proportional to an exponential of a voltage representative of the number of counting is integrated as the shutter is opened until the integrated value reaches a predetermined level at which time the shutter is closed.

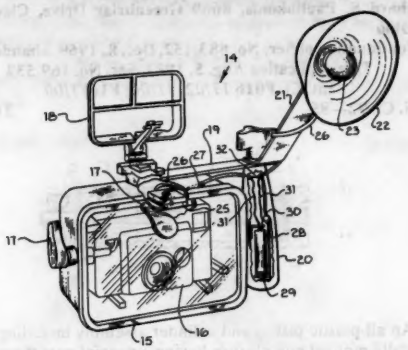
3,703,131

CAMERA FLASH SWITCH ADAPTER

Owsley H. Brigham, 7510 Morningside Drive, Indianapolis, Ind.

Filed April 23, 1971, Ser. No. 136,966
Int. Cl. G03b 15/02, 15/04, 15/035
U.S. Cl. 95—11 L **13 Claims**

A switch adapter for operably connecting a camera flash light to a camera having a batteryless flash cube receiver. A housing mountable to the camera receiver has a pair of electrical contacts mounted therein which are closable by the outwardly projecting flash actuator of the camera. A square configured element rotatably mounted to the housing abuts the



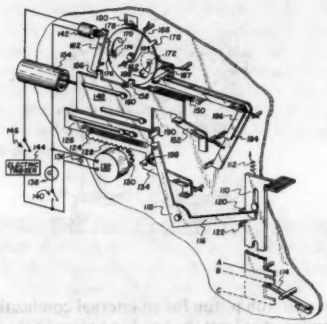
depressible member of the receiver and is provided with a ridge to lockingly engage the receiver.

3,703,132

ELECTRIC GENERATOR DRIVE MECHANISM

David E. Beach, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 29, 1969, Ser. No. 861,916
Int. Cl. G03b 9/70
U.S. Cl. 95—11.5 **5 Claims**



Device for driving the rotor of an electric generator which includes a spring biased drive member operatively connected to the generator rotor. The biasing spring is normally not effective to bias the drive member and is rendered effective during the process of setting the drive members in motion. The output of the generator may supply power to a camera flash lamp circuit and/or exposure control mechanism.

3,703,133

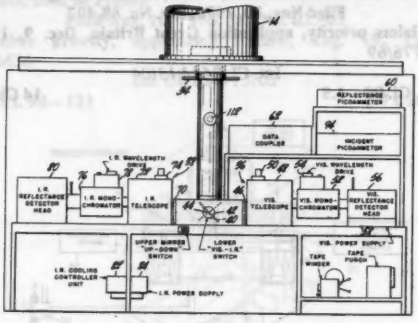
OBTAINING GROUND TRUTH FOR MULTISPECTRAL PHOTOGRAPHY

Edward F. Yost, Jr., Northport, N.Y., assignor to Spectral Data Corporation, Hicksville, N.Y.

Filed March 31, 1970, Ser. No. 24,172
Int. Cl. G03b 29/00
U.S. Cl. 95—12.5 **12 Claims**

The ratio of the intensity of the radiation directionally reflected from a background or reference target in a selected portion of a spectral region extending from substantially 260 nanometers to substantially 3,000 nanometers or emitted by the target in a selected portion of a spectral region extending from substantially 3,000 nanometers to substantially 20,000 nanometers to the intensity of incident solar radiation at a point near the target is determined at intervals of 5 nanome-

ters. Similar ratios are determined for a specimen of an anomalous target visually similar to the background target. Filters are selected for multispectral photography having maximum transparency in the bands where the ratios are different. Multispectral photographs employing such filters are optimally adapted to distinguish between the two types of targets.



3,703,134

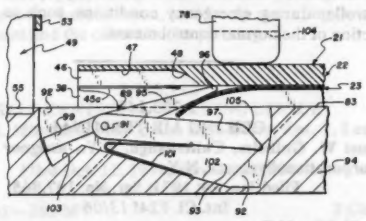
PRINT STRIPPING MECHANISM WITH SELF-ALIGNING STRIPPER FINGERS

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 2, 1971, Ser. No. 159,324

Int. Cl. G03b *17/50*

U.S. Cl. 95—13 **13 Claims**



A processing camera for use with film units of a type including an image-recording element separably coupled to a generally rigid carrier or frame. Grooves in the frame confront the image-recording element and are adapted to receive pivotally mounted stripper fingers of the camera that separate the image-recording element from the frame as the latter is moved past the stripper fingers. The stripper fingers are provided with aligning members that engage reference surfaces on the frame to thereby establish proper alignment of the fingers relative to the frame and grooves immediately prior to entry of the fingers into the grooves.

3,703,135

MULTIPLE IMAGE FILM EXPOSURE AND PROJECTION SYSTEM

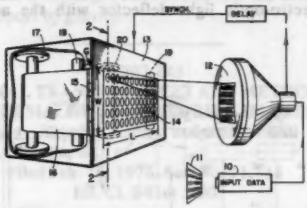
Paul Wentworth Lang, Westlake Village, Calif., assignor to Michael H. du Pont, Los Angeles, Calif., a part interest

Filed March 15, 1971, Ser. No. 124,010

Int. Cl. G03b *19/07*

U.S. Cl. 95—36 **1 Claim**

A plurality of individual image forming lenses provided in rows and columns in fixed relationship to each other is positioned front of a single film frame upon which rows and columns of small areas are to be exposed to different pictures such as a microfiche. Each lens has associated with it an individual shutter which is normally closed. Any one scene to be exposed to a given area on the film can be exposed by opening only the shutter associated with the corresponding lens positioned to project the scene on the particular area. Thus by sequentially opening and closing the various shutters as the scenes are changed, multiple images are formed on the main film frame in desired rows and columns without having to move the film itself or the camera. A reverse procedure is provided for reading out any one of the individual pictures formed on the film.



3,703,136

PHOTOGRAPHIC CAMERA WITH INTERCHANGEABLE OBJECTIVE SHUTTER

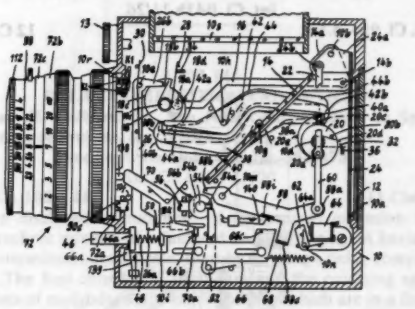
Gerhard Schwarz, Munich, Germany, assignor to Compur-Werk Gesellschaft mit beschrankter Haftung & Co., Munich, Germany

Filed Oct. 16, 1970, Ser. No. 81,324

Claims priority, application Germany, Oct. 22, 1969, P 19 53 229.7

Int. Cl. G03b *19/12*

U.S. Cl. 95—42 **6 Claims**



A camera body, preferably of the single lens mirror reflex type, having provision for interchangeably receiving various objective shutter units, each unit containing its own individual shutter. The camera body is useful both with shutter units of older type in which the timing of the shutter is controlled mechanically, and with shutter units of newer type in which the shutter timing is controlled electronically. The body contains mechanism for synchronizing the movement of the movable parts within the camera body with the movement of the movable parts in the shutter unit, whether the shutter unit be of the mechanicallytimed type or of the electronically timed type.

3,703,137

HIGH-SPEED PRINTING APPARATUS

Lawrence K. Anderson, Stirling; Martin Feldman, Springfield, and Douglas Arthur Pinnow, Berkeley Heights, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

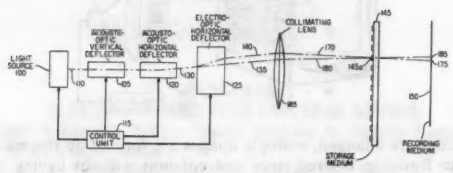
Filed March 19, 1971, Ser. No. 125,948

Int. Cl. B41b *17/00, 17/08*

U.S. Cl. 95—4.5 R **7 Claims**

A high-speed printer includes a prerecorded multicharacter font stored in holographic form. Selection of a stored

character for projection onto a recording medium is accomplished by means of a conventional X-Y acousto-optic deflection system. To achieve justified lines and attractively composed words, the printer must have a variable character- and word-spacing capability. This capability is realized by combining an electro-optic light deflector with the acousto-optic



system in such a way as to controllably vary the angle at which an incident light beam interrogates a selected holographic character. For each different interrogation angle, the selected character is projected to a slightly different location along a row of the recording medium. In this way there is provided a vernier adjustment of the positions of characters to be printed.

3,703,138

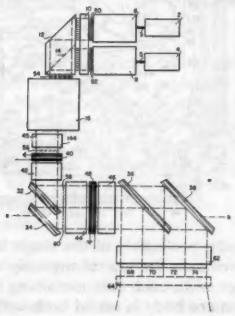
PHOTOCOMPOSING MACHINE

Louis M. Moyroud, c/o Photon, Inc., 355 Middlesex Avenue, Wilmington, Mass.

Continuation-in-part of Ser. Nos. 617,912, Feb. 23, 1967, Pat. No. 3,512,462, and Ser. No. 827,128, May 21, 1969. This application March 19, 1971, Ser. No. 126,111

Int. Cl. B41b *21/26*

U.S. Cl. 95—4.5 R **12 Claims**



A light-deflection system which is adapted to function as a photocomposing system is described. A laser light beam is deflected to any one of a group of locations along a character matrix array in order to illuminate a pre-selected character which is to be projected onto a light-sensitive surface such as a film. After selection, the character-bearing light beam is directed to a desired position on the film by a group of crystal deflectors in order to form lines of composition on the film. Also disclosed is a system for automatically positioning characters on a line after a point size change, a white space reduction circuit, "coarse" and "fine" character positioning or spacing, a light beam deflection system, and an embodiment of the optical leverage concept in which the character size-changing mechanism is positioned in the optical path between the character image deflection system and the film, so that the spacing of the characters relative to each other is not affected by a change in point size, since all provisions for character spacing are completed before the character images pass through the size-changing mechanism.

3,703,139

PRESSURE CONTROL SYSTEMS

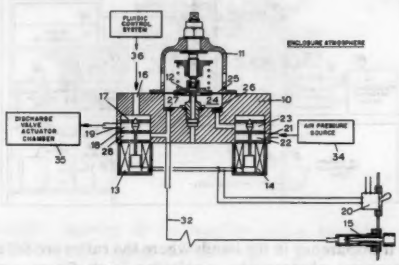
Owen Desmond Furlong, East Coker, England, assignor to Westland Aircraft Limited, Yeovil, Somerset, England

Filed Nov. 10, 1970, Ser. No. 88,402

Claims priority, application Great Britain, Dec. 9, 1969, 56,776/69

Int. Cl. B64d *13/04*

U.S. Cl. 98—1.5 **14 Claims**



A fluid pressure controller or emergency pressure controller comprises changeover valve means for substitution of the controller for normal control means and isolation thereof, pressure reducing means for regulating supply pressure through the controller to a pneumatically operable pressure varying means for an enclosure, and controllable valve means for controlling the output pressure from the controller. The controllable valve means may be a bleed valve, settable either manually or by a pressure capsule responsive to pressure in the enclosure. Preferably the normal control means is a fluidic pressure control system for the enclosure, and the fluid pressure controller functions as a selectively operable override controller during emergency conditions, such as upon malfunction of the normal control means.

3,703,140

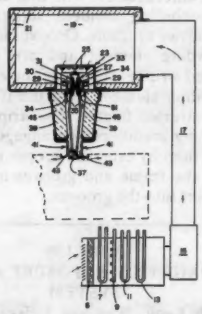
CEILING AIR TERMINAL

August W. Gutheim, Chittenango, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 20, 1971, Ser. No. 107,965

Int. Cl. F24f *13/06*

U.S. Cl. 98—40 D **1 Claim**



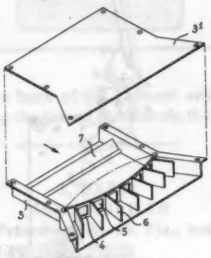
A ceiling air terminal including inflatable bladders that cooperate with cut-off plates to regulate the volume of treated air discharged from the terminal into the area being served. The cut-off plates have a first curved portion which defines the extremity of each plate closest to each inflatable bladder and a planar portion immediately adjacent to the curved portion. The planar portion is at an angle of substantially 5° relative to a vertical tangent line to the curved portion, the planar portion being inclined away from the inflatable bladder.

3,703,141

AIR VENT DEVICES FOR AIR CONDITIONING SYSTEMS

Claude Pernoud, Billancourt, France, assignor to Regie Nationale des Renault, Billancourt and Automobiles Peugeot, Paris, both of France

Filed Aug. 10, 1970, Ser. No. 62,505
Claims priority, application France, Aug. 19, 1969, 6928436
Int. Cl. F24f 13/08
U.S. Cl. 98—121 7 Claims



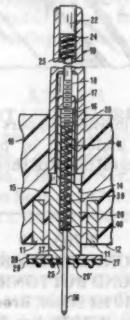
An air vent device for use in any type of air conditioning systems, in particular that of a motor vehicle employing a stream of air, including a flexible blade mounted for deflection of the air stream, apertures therein through which the stream of air passes and a plurality of fins or tubular deflectors extending generally perpendicular to the blade. The combination is preferably formed as a single body of moulded plastic or of metal. The air vent can be adjusted to various positions for converging and diverging the stream of air, a given deflection producing a certain degree of divergence or convergence of the deflectors. Means for mounting the air vent includes freely and slidably mounting the ends with a guiding slot and pin arrangement therebetween, and freely mounting one end for movement and the other end for pivoting.

3,703,142

SELF-CENTERING MARKING DEVICE

Kenneth H. Mimlitch, 1029 Cross Keys Drive, Apt. 3, Lexington, Ky.

Filed Oct. 12, 1970, Ser. No. 80,004
Int. Cl. B41k 1/20
U.S. Cl. 101—382 MV 2 Claims



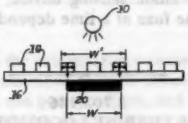
A marker, which prints a concentric element such as a nut, bolt, or the like, for example, when moved into engagement with a surface, is retained adjacent one end of a base by magnets within the base. The marker is carried on a protruding portion of a support, which is slidably mounted within the base and carries a locating pin extending longitudinally therefrom and through the marker. When the locating pin is disposed on the surface at the point at which the center of the nut or bolt is to be located, a spring, which acts on the locating pin, is overcome by depressing the base so that the marker can be moved into engagement with the surface at the desired location. After printing, the marker is released from the effect of the magnets by pushing the support away from the base whereby the field of the magnets is no longer effective so that the marker drops off of the support by gravity.

3,703,143

THERMAL TRANSFER SHEET AND METHOD OF THERMALLY TRANSFERRING IMAGES

Joseph Gaynor, Arcadia, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Feb. 16, 1970, Ser. No. 11,714
Int. Cl. B41m 5/00
U.S. Cl. 101—470 10 Claims



This invention prevents an improved thermal transfer sheet and method of thermally transferring images. The transferability of images in a thermal transfer process is greatly improved by utilizing a thermal transfer sheet comprising a reticulated or discontinuous layer of transfer material.

3,703,144

DELAY COMPOSITION AND DEVICE

William H. Colburn, Jr., San Jose, Calif., assignor to Space Ordnance Systems, Inc., Saugus, Calif.

Filed Sept. 16, 1969, Ser. No. 858,475
Int. Cl. C06c 11/00
U.S. Cl. 102—24 11 Claims

The disclosed embodiment of the present invention is a pyrotechnic mixture of a fuel and an oxidizing agent having a predetermined burning rate, thereby forming a delay composition. The fuel consists of zirconium and the oxidizing agent consists of molybdenum trioxide, both of which are in a finely divided form and in intimate admixture, and are present in proportions of about ⅛ to about 2 moles of molybdenum trioxide per mole of zirconium. This composition provides a time delay when employed in a train of pyrotechnic materials. One embodiment of such a train of materials includes a column of the delay composition positioned between corresponding ends of two deflagrating cords.

3,703,145

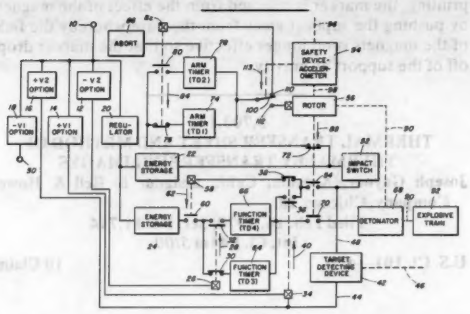
SELECTIVE ARMING MODE AND DETONATION OPTION ORDNANCE FUZE

Lawrence E. Burkhardt, Burtonsville, and Charles H. Johnson, White Oak, both of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Dec. 5, 1969, Ser. No. 882,572
Int. Cl. F42c 11/06, 9/00, 15/40
U.S. Cl. 102—70.2 R 7 Claims

An ordnance fuze having a detonation option selection circuit, an arm circuit and a detonation circuit. The detonation options are selected by option circuits responsive to a particular voltage magnitude and polarity to provide output signals which actuate a plurality of switches to select an energy path to the detonator. The paths may include timing circuits to allow detonation of the fuze after the occurrence of a sensed

condition. The condition may be sensed by an impact switch or by a target detecting device. The arm circuit includes time



delays, a delivery mode sensing device, safety devices and switches to arm the fuze at a time dependent on the delivery mode of the fuze.

3,703,146

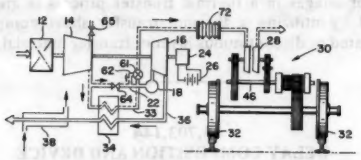
GAS TURBINE LOCOMOTIVE

Andre Kovats, 13 Baker Road, Livingston, N.J.

Filed March 17, 1971, Ser. No. 125,272

Int. Cl. B61c *5/02, 9/30*; F02c *3/10*

U.S. Cl. 105—61.5 **7 Claims**



A gas-turbine power plant for locomotives, especially for lightweight turbotrains, comprising a pressure generating gas-turbine unit, which includes a compressor, combustor and a gas-turbine, in combination with an air-turbine, the latter driving the locomotive. The improvement of the present invention is that the compressor of the pressure generating unit, in addition to supplying air for the combustor and gas-turbine, also supplies air under pressure for the air-turbine, which air is first preheated by the exhaust gas from the gas-turbine in a heat exchanger. Preferably the air-turbine has first and second counter-rotating stages separately connected to the locomotive drive shaft through a pair of gear trains. The second stage of the air-turbine utilizes the momentum of the exhaust whirl of the first stage when, because of increased torque requirement, the locomotive accelerates or slows down. This provides the gas-turbine plant with high starting torque and high efficiency at normal operation.

The present invention is particularly useful for small turbotrains, or for locomotives requiring two gas-turbine power plants of about 1,000 HP to 1,600 HP each.

3,703,147

LOCKING MECHANISM FOR VERTICALLY ADJUSTABLE DRAWING BOARDS

Bror Olle Herbert Selander, Malmo, Sweden, assignor to AB Spacio System, Malmo, Sweden

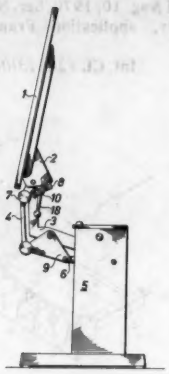
Filed April 27, 1971, Ser. No. 137,793

Claims priority, application Sweden, April 27, 1970, 5829/70

Int. Cl. A47d *9/00*

U.S. Cl. 108—145 **3 Claims**

A parallel motion guiding mechanism supporting a drawing board and including two opposite levers is provided with a link between the levers pivotally connected with one of the levers and connected with the other lever for rotational movement and displacement longitudinally of the link. A locking



mechanism is provided to optionally lock the link to said other lever in order to prevent a change of the mutual spacing of the levers and thereby to prevent movement of the parallel motion guiding mechanism.

3,703,148

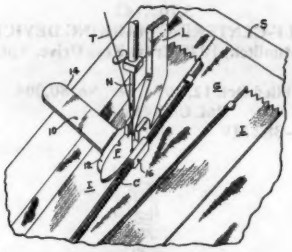
GUIDE FOR SEWING INVISIBLE FASTENERS

Walter Thomas Ackermann, Watertown, and Thomas Joseph Daley, Woodbury, both of Conn., assignors to Scovill Manufacturing Company, Waterbury, Conn.

Filed Aug. 13, 1971, Ser. No. 171,467

Int. Cl. D05b *29/12, 35/06*

U.S. Cl. 112—150 **5 Claims**



A guide for sewing invisible zippers onto fabric may be adhesively secured to underside of presser foot of sewing machine. Guide is integral piece of sheet material and includes manipulating tab.

3,703,149

PRE-MADE BUTTONHOLE FINISH, A NEW TYPE OF BOUND BUTTONHOLE

Barbara George, 333 101st Street, Brooklyn, N.Y.

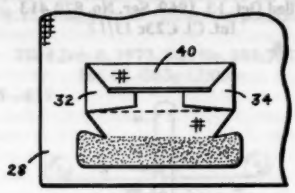
Filed Nov. 9, 1970, Ser. No. 87,894

Int. Cl. A44b *17/00*

U.S. Cl. 112—264 **3 Claims**

The pre-made buttonhole finish is a piece of fabric that is cut in a specific form with an iron-on adhesive along the edges of one side of the fabric, and a sewing guide line marked near the center of it forming a one piece buttonhole binding. This application is then sewn on the desired place of a finished garment; then after cutting the garment along the slit in the center of the pre-made buttonhole finish the two side edges

are folded towards the center and ironed on. The top and bottom edges then folded towards the center, tucked into the slit,

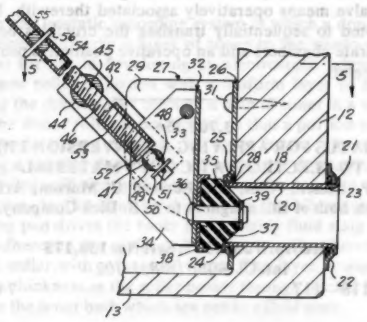


pulled out from the back of the garment and then ironed on flat in place forming the bound buttonhole therein.

3,703,150
MARINE BAILER

Axel Moeller, St. Petersburg Beach, Fla., assignor to Moeller Mfg. Co., Inc., Greenville, Miss.

Filed June 26, 1970, Ser. No. 50,220
Int. Cl. B63b *13/00*
U.S. Cl. 114—197 **6 Claims**



A remote control boat drainage valve assembly consisting of a thimble extending through an opening at the stern of a boat with a bracket secured in the stern having a pivoted arm carrying a plug engageable in the thimble. An elongated operating stem extends threadedly through a yoke carried by the bracket and is rotatably connected to the arm for moving the plug relative to the thimble by rotating the stem.

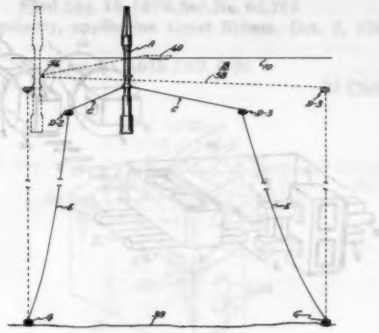
3,703,151
BIASED TAUT LINE MOORING SYSTEM

John C. Clement, Cypress, Calif., assignor to Ocean Design Engineering Corporation, Long Beach, Calif.

Continuation of Ser. No. 778,388, Nov. 25, 1968, abandoned.
This application Sept. 4, 1970, Ser. No. 69,954
Int. Cl. B63b *21/00, 21/52*
U.S. Cl. 114—230 **8 Claims**

A buoyant surface object that tends to at all times occupy a fixed predetermined position due to the tensioning of at least two pennant lines that extend outwardly therefrom. Each pennant line is connected to a submerged float.

The floats are in turn connected to mooring lines that extend downwardly and outwardly therefrom. The lower ends of the mooring lines are secured to anchors. The floats due to their buoyancy tend to move to positions where their mooring lines would be vertically disposed. This tendency to so move is prevented by the pennant lines. The pennant lines as a result of tending to restrain the buoys from moving are tensioned and when no exterior force is exerted on the surface object maintain the surface object in the predetermined position. In the event that an external force moves the surface object from said predetermined position, the tension on at least one of the pennant lines is increased, and the tension on another of the pennant lines decreased, and an unbalanced force system

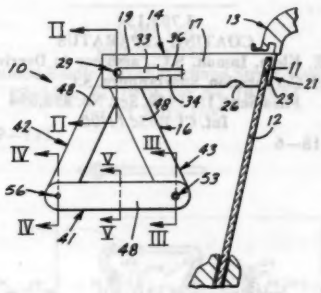


prevails. As soon as the external force ceases to act on the surface object, the floats move to their initial positions to exert balanced forces on the pennant lines, and the surface object returning to said predetermined position.

3,703,152
DISTRESS SIGNALING DEVICE

Paul S. Morton, 82 Mandalay Drive, Oshtemo, Mich.

Filed Feb. 7, 1972, Ser. No. 224,033
Int. Cl. E01f *9/10*
U.S. Cl. 116—28 R **9 Claims**



A vehicle distress signaling device. The signaling device has an elongated housing adapted to store a triangularly shaped and foldable distress signaling device therein. A hook is provided on the housing adjacent one end and is adapted to couple the housing to the upper margin of a vertically adjustable window panel on the exterior of a side of the vehicle. A coupling device is provided for coupling triangularly shaped signaling device to an end of the housing remote from the hook when the signaling device is unfolded to the triangular shape to thereby display the signaling device on the exterior side of the vehicle.

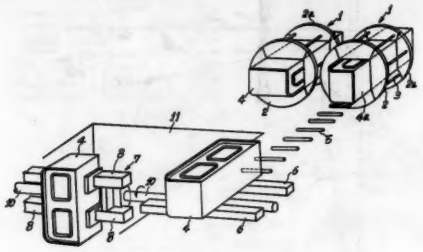
3,703,153
METHOD FOR BUILDING SHIPS

Kazuo Maeda, Ichihara, Japan, assignor to Mitsui Shipbuilding and Engineering Co. Ltd., Tokyo, Japan

Filed Dec. 14, Ser. No. 97,817
Int. Cl. B63b *3/04*
U.S. Cl. 114—77 R **4 Claims**

A method of building ships in which predetermined blocks of the hull are fabricated remotely and are transported to dockside at an elevated level. The blocks are displaced to overlie the dock bottom and are rotated downwardly onto a

conveyor on the dock bottom and are mounted on the conveyor by means of a buffer plate which is adjustable on the conveyor. The block is then displaced into position adjoining

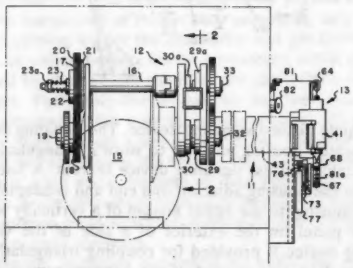


other hull blocks on the dock bottom and is adjusted in position to be united with the other hull blocks by means of the adjustable buffer plate.

ERRATUM

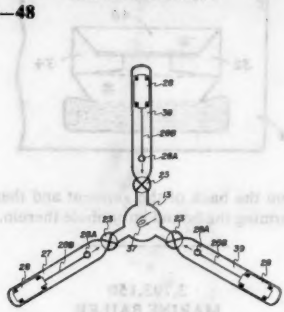
For Class 116—28 R see:
Patent No. 3,703,152

3,703,154
COATING APPARATUS
Norman E. Klein, Inman, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.
Filed Sept. 15, 1969, Ser. No. 858,094
Int. Cl. B05c *11/00*
U.S. Cl. 118—6 **1 Claim**



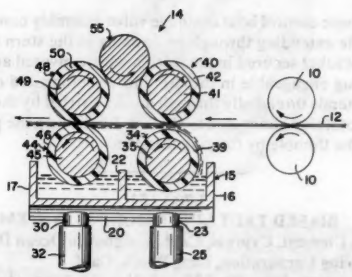
Apparatus for extruding a coating around a core including an extruder screw, stock feeder means operatively associated with the screw, and core coating means disposed adjacent the delivery portion of the screw; the stock feeder comprising pairs of opposed finger elements positioned to contact strip stock and means for sequentially moving the pairs of finger elements to engage the strip stock and to advance same into contact with the extruder screw; the coating means comprising a die having an opening therethrough, a guide member disposed within the opening forming a cavity through the die, means for withdrawing a coated core material from the die and means adjacent the core withdrawal means responsive to variations in the thickness of the coated core to control the withdrawal means.

3,703,155
APPARATUS FOR PHOTOCATHODE PROCESSING
John P. Choisser, 8487 Paseo Del Ocaso, La Jolla, Calif.
Filed Oct. 13, 1969, Ser. No. 870,413
Int. Cl. C23c *13/12*
U.S. Cl. 118—48 **4 Claims**



An evacuated coating chamber includes a substrate support and a centrally disposed heater means. A plurality of crucible means are located in separate chambers which are each radially disposed with respect to the coating chamber and having each a valve means operatively associated therewith. Means are adapted to sequentially translate the crucibles between said separate chambers and an operative position is proximity to said heater.

3,703,156
APPARATUS FOR APPLYING A CONVERSION LIQUID TO ELECTROSTATIC COPY MATERIAL
George P. Niesen, Niles, and Edward C. Marum, Arlington Heights, both of Ill., assignors to A. B. Dick Company, Niles, Ill.
Filed April 28, 1971, Ser. No. 138,175
Int. Cl. B05c *1/08*, *11/02*
U.S. Cl. 118—117 **7 Claims**



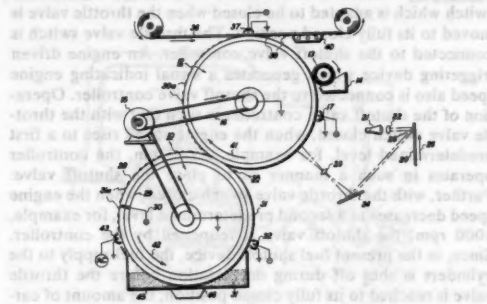
A length of developed electrostatic copy material is advanced to a conversion zone with the image side facing downwardly and is received in a gap defined by adjacent peripheral surfaces of upper and lower rollers, the lower roller being partially immersed in a conversion liquid contained in a trough. This lower roller is driven such that its linear peripheral speed is approximately three times the speed of the copy material whereupon such roller develops a film of the conversion liquid on its peripheral surface and applies such film as a metered layer to the underside of the copy material as the same passes through said gap. The copy material is then fed to the nip of a pair of upper and lower squeegee rollers, the lower squeegee roller being partially immersed in the conversion liquid. When the apparatus is not in use, the conversion liquid is drained into a closed storage tank.

3,703,157

METHOD AND APPARATUS FOR FORMING A UNIFORM LAYER OF POWDER DEVELOPER ON A SURFACE

John Maksymiak, Penfield, and Lawrence M. Hart, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 6, 1971, Ser. No. 104,364
Int. Cl. G03g *13/00*
U.S. Cl. 118—637 11 Claims



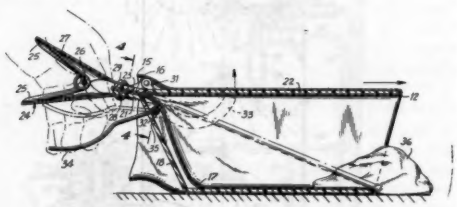
In an electrostatic recording system in which a donor roller is employed to carry a layer of toner to the photo-receptor member for use in developing an electrostatic latent image, the donor roller is loaded with a uniform layer of toner by rotating the donor roller through a bath of toner in a vibrating pan. The donor roller is positioned so that a portion of its circumference passes through the toner in the vibrating pan forming a varying depth bath of toner, the thinnest depth of toner being sufficiently thin to fluidize the toner in this thin layer area. In this thin level of toner the vibrations of the vibrating pan drives the toner into a highly fluid state and the toner adheres to the surface of the donor roller thereby loading the roller with a layer of toner. The layer is wiped to a uniform thickness as the roller passes through thicker levels of toner in the toner bath which are not in a fluid state.

3,703,158

SCOOP FOR ANIMAL WASTE

Seymour A. Lemler, 29 East 9th Street, New York, N.Y.

Filed Sept. 16, 1971, Ser. No. 181,167
Int. Cl. A01k *29/00*
U.S. Cl. 119—1 6 Claims



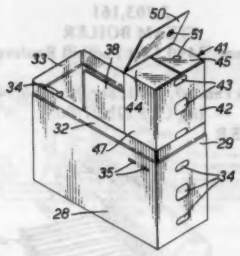
A scoop for the waste of an animal, such as a dog, which permits the dog owner to scoop the solid waste matter into a plastic bag without dirtying his hands or the scoop. The scoop is adapted to be loaded with a plastic bag in such a manner that, upon removal of the plastic bag, the exterior surfaces of the bag are clean and all surfaces of the bag that could come in contact with the solid waste matter are internal surfaces. The bag carrying the solid waste matter can be closed with a twist tie and deposited in a waste receptacle leaving a completely clean scoop ready for subsequent use.

3,703,159

CONTAINER FOR TRANSPORT OF ANIMALS

Brigadier George Patrick Rose-Miller, "Barevan" Cawdor, Nairn, Scotland

Filed Aug. 18, 1970, Ser. No. 64,705
Claims priority, application Great Britain, Oct. 3, 1969, 48,626/69
Int. Cl. A01k *1/02, 9/00*
U.S. Cl. 119—19 21 Claims



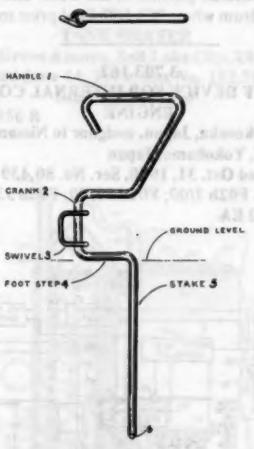
A box for transporting unweaned animals of the type which nurse in a standing position. The box, normally closed at its bottom and opened at its top includes a platform to support a liquid feed vessel vertically such that the vessel is prevented from either upward or downward movement. The vessel includes a lower opening and a feed device attached to said lower opening so that the nipple of the device is at a height similar to the height of the nipple on a mother animal and so that the nipple is at one end of the box and off to one side thereof so that the animal can stand length-wise in the box and turn its head while feeding.

3,703,160

PET-TENDER

Milburn Emmett Biddle, 19115 Hartland Street, Reseda, Calif.

Filed Dec. 31, 1970, Ser. No. 103,043
Int. Cl. A01k *3/00*
U.S. Cl. 119—121 2 Claims



The Pet-Tender is an animal ground anchor tether, shown in FIGS. 1 and 2, is a metal stake device which is attached to the leash of an animal being confined. The stake of the Pet-Tender is completely inserted in the ground by the application of foot force on the foot step, while holding the Pet-tender by the handle in a vertical position. The leash is attached to the swivel, which is located on the crank of the Pet-Tender. Forces exerted by the animal through the leash rotate the Pet-

Tender in the ground about the stake, so that the crank and foot step, which is also the crank arm, lie in the same plane with the line of applied force. The reaction forces of the ground to the foot step and the stake provide adequate resistive moments and forces to prevent removal of the Pet-Tender by the animal. The Pet-Tender may be removed from the ground by exerting a relatively small vertical pull on the handle.

3,703,161

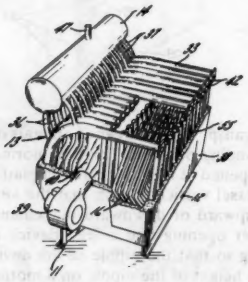
STEAM BOILER

Chadwell O'Connor, 3490 East Foothill Boulevard, Pasadena, Calif.

Filed Feb. 19, 1971, Ser. No. 116,944

Int. Cl. F22b *21/00*

U.S. Cl. 122—235 R **9 Claims**



A water-tube boiler for generating steam wherein the steam is generated in a circulatory system which is separated from and independent of the boiler's main steam drum. The boiler includes a plurality of header tubes which collectively define a fire chamber, and which serve both to distribute water to the main convection tubes for heating and to recirculate the unevaporated portion of the water through the system after the generated steam is drawn off. During each circulatory cycle in the header tubes, the generated steam is separated from the unevaporated portion of the water and drawn off to the main steam drum where it is collected prior to discharge.

3,703,162

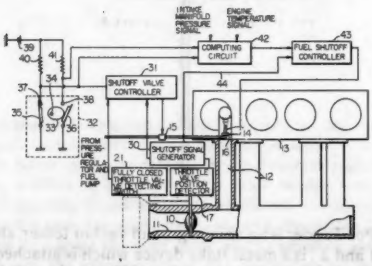
FUEL SHUTOFF DEVICE FOR INTERNAL COMBUSTION ENGINE

Shigeo Aono, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 31, 1970, Ser. No. 80,439

Int. Cl. F02b *3/00*; F02d *31/00*; F02b *33/00*

U.S. Cl. 123—32 EA **10 Claims**



A fuel shutoff device adapted for incorporation into an automobile fuel supply system as to shut off the fuel supply during deceleration thereby reducing the amount of carbon monoxide and hydrocarbons emitted in exhaust. A throttle valve position detector is operatively associated with a throttle valve so as to produce a voltage signal corresponding to the position of the throttle valve. The voltage signal is applied to a fuel shutoff signal generator which generates a fuel shutoff signal when the time derivative of the voltage signal exceeds a predetermined value. The fuel shutoff signal is applied to a shutoff valve controller which is actuated to close a shutoff valve when the fuel shutoff signal is applied to the controller. The fuel shutoff signal is also applied to a fuel shutoff controller which de-energizes an injection pulse amplifying circuit when the fuel shutoff signal is applied to the controller. The present fuel shutoff device further includes a throttle valve switch which is adapted to be closed when the throttle valve is moved to its fully closed position. The throttle valve switch is connected to the shutoff valve controller. An engine driven triggering device which generates a signal indicating engine speed also is connected to the shutoff valve controller. Operation of the shutoff valve controller is such that with the throttle valve switch closed, when the engine speed rises to a first predetermined level, for example, 2000 rpm, the controller operates in such a manner as to close the shutoff valve. Further, with the throttle valve switch closed, when the engine speed decreases to a second predetermined level, for example, 1000 rpm, the shutoff valve is reopened by the controller. Since, in the present fuel shutoff device, the fuel supply to the cylinders is shut off during deceleration before the throttle valve is reached to its fully closed position, the amount of carbon monoxide and hydrocarbon exhaust is small in comparison with an automobile employing a conventional fuel shutoff device.

3,703,163

ROTARY PISTON INTERNAL COMBUSTION ENGINE

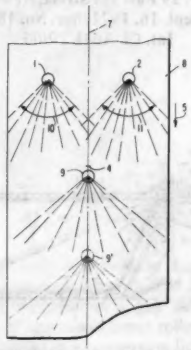
Heinz Lamm, Esslingen-St. Bernhardt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertuerkheim, Germany

Filed May 15, 1970, Ser. No. 37,671

Claims priority, application Germany, May 17, 1969, P 19 25 174.2

Int. Cl. F02b *53/12*

U.S. Cl. 123—8.09 **13 Claims**



A rotary piston internal combustion engine particularly of trochoidal construction which has a rotating piston that slides along the running surface of the casing and which includes several spark plugs in the running surface of the casing which are arranged adjacent one another in the axial direction of the casing.

3,703,164

ATMOSPHERIC POLLUTION CONTROL ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE

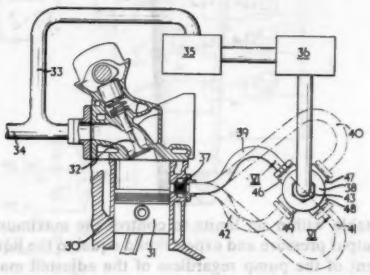
John Harold Weaving, Coventry, England, assignor to British Leyland Motor Corporation Limited, London, England

Filed Feb. 19, 1971, Ser. No. 116,828

Claims priority, application Great Britain, Feb. 19, 1970, 7,907/70

Int. Cl. F02m *25/06*; F02b *47/08*

U.S. Cl. 123—119 A 10 Claims



An internal combustion engine having a valve in addition to normal inlet and exhaust valves in the cylinders of the engine through which part of the gaseous products of combustion are removable, before they have passed through the exhaust system of the engine, and by which the gaseous products of combustion extracted through the additional valves are re-introduced into each cylinder of the engine after closure of the inlet valve thereof. By recirculating part of the exhaust gases from the cylinders in this way, the proportion of oxides of nitrogen in the final exhaust gases from the engine is reduced.

3,703,165

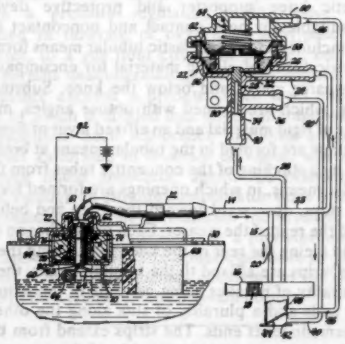
FUEL TANK VENT CONTROL

Kai H. Hansen, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 15, 1971, Ser. No. 162,995

Int. Cl. F02m *25/08*

U.S. Cl. 123—136 4 Claims



In an internal combustion engine powered vehicle, fuel vapors are vented from the fuel tank to the engine induction system. The tank vent line is controlled by a valve operated both by a float responsive to the fuel level and by a solenoid energized through the engine ignition switch.

3,703,166

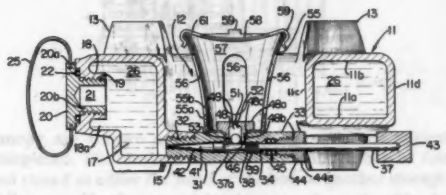
LIQUID FUEL COOKING STOVE

Michael W. White, Jr., and Jacques A. Plamondon, both of Denver, Colo., assignors to Colorado Technologists Incorporated, Englewood, Colo.

Filed July 8, 1971, Ser. No. 160,747

Int. Cl. F24c *5/02*

U.S. Cl. 126—44 23 Claims



A portable liquid fuel stove is disclosed herein which is particularly suited for cooking out of doors. The stove includes an annular shaped, cast fuel tank with a central opening having circumferentially spaced depending bottom ribs and upstanding top ribs both preferably cast with the fuel tank to form an integral unit. A control valve assembly preferably extends radially inwardly from the tank, and a fuel vaporizing section extends transverse to the valve assembly in axial alignment within the central opening in a lower portion of the tank. Vaporized fuel is passed from the fuel vaporizing section through an orifice disposed within the central opening in a lower portion of the tank to provide a stream of vaporized fuel. A burner cup in the central opening is substantially confined within the vertical extent of the tank to provide a mixing chamber. The flame produced heats the tank to pressurize the tank to force the fuel from the tank into the vaporizing chamber and vaporize the fuel in the vaporizing chamber for continuous burning.

3,703,167

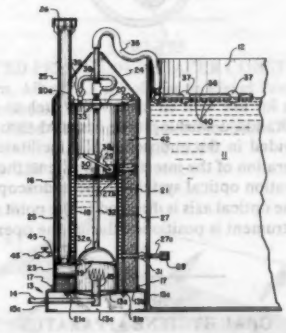
TANK HEATER

Pat Maher, 65 Grove Avenue, Salt Lake City, Utah

Filed June 14, 1971, Ser. No. 152,709

Int. Cl. F24h *1/00*

U.S. Cl. 126—350 R 7 Claims

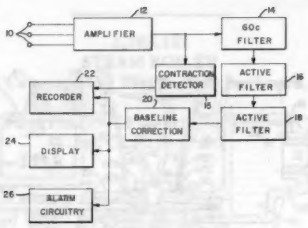


A heater for stock watering tanks and the like. A heating unit acts on a constantly replenished small volume of water to heat it and to build up a stream pressure that is discharged through openings in a floating tube that extends around the periphery of the tank.

3,703,168
FETAL HEART MONITOR WITH PARTICULAR SIGNAL CONDITIONING MEANS

Richard D. Frink, 207 Sycamore Drive, Westwood, Mass.

Filed March 30, 1970, Ser. No. 23,737
Int. Cl. A61b 5/04
U.S. Cl. 128—2.06 R 4 Claims

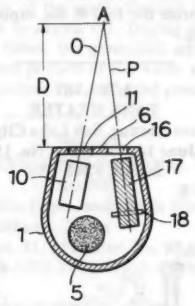


A fetal heart monitor capable of detecting fetal heart activity in a non-invasive manner and in the presence of noise and substantially stronger maternal heart signals. The system is also operative to simultaneously monitor labor contractions in a non-invasive substantially noise free manner, and additionally provides means for selectively displaying the rhythm ECG.

3,703,169
ENDOSCOPE

Teruo Ouchi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1970, Ser. No. 99,769
Claims priority, application Japan, Dec. 27, 1969, 44/123642
Int. Cl. A61b 1/06, 1/12
U.S. Cl. 128—6 5 Claims



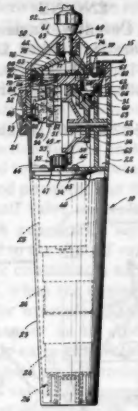
Endoscope for use with an instrument such as a forceps, a stripper brush, and a washing tube inserted through a guide channel provided in the endoscope. To facilitate and insure the exact operation of the inserted instrument, the optical axis of the observation optical system of the endoscope is so positioned that the optical axis is directed to the point at which the tip of the instrument is positioned during the operation of the instrument.

3,703,170
ORAL HYGIENE APPARATUS

William D. Ryckman, Jr., Asheboro, N.C., assignor to General Electric Company

Filed March 4, 1971, Ser. No. 120,828
Int. Cl. A61h 9/00
U.S. Cl. 128—66 17 Claims

Oral hygiene apparatus of the variable pressure pulsed liquid jet type that includes a hand-held unit and a liquid reservoir which may be separate or incorporated in the hand-held unit. The unit contains an electric motor, electrical energy supply means, a pulsating pump and a pressure regulator that

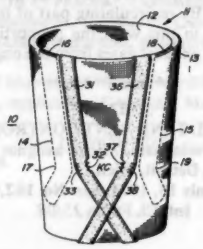


is adjustable within set limits to control the maximum peak liquid output pressure and expels liquid equal to the liquid displacement of the pump regardless of the adjusted maximum peak liquid output pressure.

3,703,171
ATHLETIC KNEE SUPPORTER AND PROTECTIVE DEVICE

Charles A. Schiavitto, 604 North 8th Street, Allentown, Pa.

Filed March 9, 1971, Ser. No. 122,430
Int. Cl. A61f 3/00
U.S. Cl. 128—80 C 10 Claims



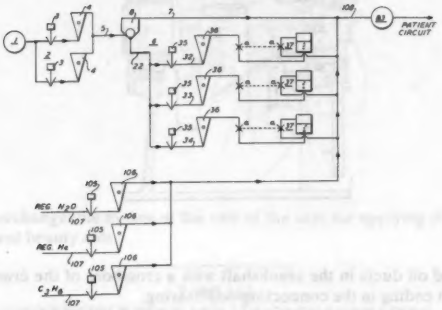
An athletic knee supporter and protective device is described, suitable for both contact and noncontact sports. The device includes a tapered elastic tubular means formed of two concentric tubes of elastic material for encompassing a leg of the wearer above and below the knee. Substantially planar stays, which are formed with obtuse angles, may include a layer of rigid material and an affixed layer of firm foam rubber. Pockets are formed in the tubular means at both sides of the knee by a stitching of the concentric tubes from the top of the tubular means, in which openings are formed for insertion of the stays, downward toward the knee and below the knee toward the rear of the wearer. Each pocket has an obtuse angle therein facing the rear of the knee for housing the stays. Leather-like strips are affixed to the tubular means, the strips having a plurality of notches along one side of the strip intermediate its ends and a plurality of slits along the other side thereof intermediate its ends. The strips extend from the top of the tubular means at a point one side of the center, down below the knee, compressing at the notches and expanding at the slits to cross below the knee at the bottom of the tubular means at the opposite side thereof, thereby forming an X immediately below the kneecap. A stave is provided axially along the tubular means anterior to the wearer. The stave can be a zipper in one embodiment; it can be a leather strip in another embodiment.

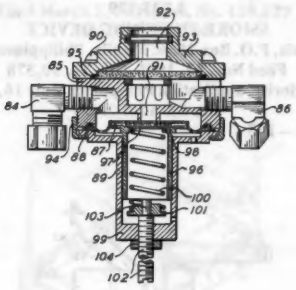
3,703,172

HEATED VAPORIZER ANESTHESIA MACHINE

Wayne W. Hay, Madison, Wis., assignor to Airco, Inc.

Continuation of Ser. No. 671,741, Sept. 29, 1967, abandoned.
This application June 26, 1970, Ser. No. 56,073
Int. Cl. A61m *17/00*
U.S. Cl. 128—188 10 Claims





An anesthesia machine which utilizes a plurality of vaporizers, each individually adapted to be heated to a constant temperature when in use and governed by a shut-off valve assembly. The oxygen carrier passes from a source through a pressure regulator, needle valve, flowmeter calibrated in flowrate of oxygen to a by-pass valve and, thereafter, to a gas fluid circuit in parallel, one branch of which permits unadulterated oxygen flow therethrough when the pressure exceeds a predetermined level and the other branch of which is divided into three subbranches in parallel via a manifold, each sub-branch including a needle valve, flowmeter calibrated in flowrate of vapor, and a vaporizer containing liquid anesthetic agent. All branches join for passage through an altitude compensator valve operating on a back pressure principle to maintain the pressure in the upstream side of the compensator at a predetermined amount above average sea level atmospheric pressure by damping the effect of pressure fluctuations occurring in the downstream portion of the system on the upstream portion.

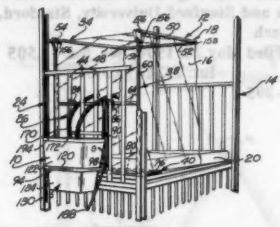
3,703,173

NEBULIZER AND TENT ASSEMBLY

Ted A. Dixon, 60 Collver Road, Rocky River, Ohio

Filed Dec. 31, 1970, Ser. No. 103,101
Int. Cl. A61m *15/00*
U.S. Cl. 128—194 16 Claims

An improved apparatus for treating a patient in a therapeutic atmosphere includes a disposable canopy which is supported by a foldable canopy frame to at least partially enclose the patient. The canopy frame is firmly held against the head of the patient's bed by a foldable frame which supports a disposable nebulizer. To reduce the possibility of cross-contamination and cleanup costs, the nebulizer assembly and



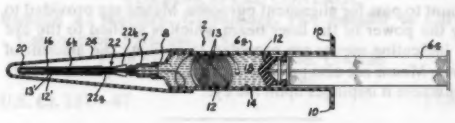
canopy are thrown away after treatment of the patient is completed. The tent and nebulizer frames can then be folded and stored at either the head of the bed or another storage location.

3,703,174

METHOD AND APPARATUS FOR CATHETER INJECTION

Gordon E. Smith, Madison, Wis., assignor to Medidyne Corporation, Chicago, Ill.

Filed July 14, 1970, Ser. No. 54,732
Int. Cl. A61m *5/00*
U.S. Cl. 128—214.4 35 Claims



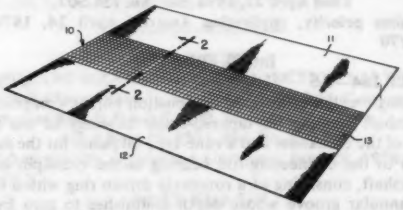
A device for injecting an elongated member, like a catheter, into a passageway like a blood vessel, including a body from which a feeding means like a needle extends and which contains the elongated member extending into the feeding means. The space in the body including the elongated member is sealed except for its communication to the outside of the device through the feeding means. There is provided a source of fluid for said space and a means for applying pressure to the space. The elongated member is of a smaller size then the needle passageway so the fluid placed under pressure forms a cushion around the member which is impelled by the pressure from the outer end of the feeding means.

3,703,175

SIMULATED PRE-FOLDED DIAPER CONSTRUCTION

Dale W. Kern, Aiken, S.C., assignor to Riegel Textile Corporation, Ware Shoals, S.C.

Filed Oct. 12, 1970, Ser. No. 80,047
Int. Cl. A61f *13/16*
U.S. Cl. 128—284 1 Claim



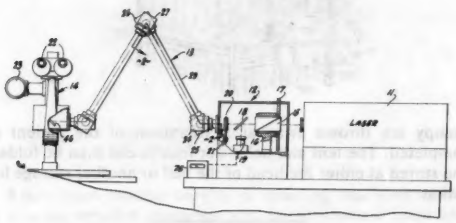
A diaper is disclosed having generally, the rectangular dimension of pre-folded diapers and consisting of a simulated pre-fold multi-ply center panel and two single-ply side panels.

3,703,176

SLIT LAMP PHOTOCOAGULATOR

Arthur Vassiliadis, Los Altos; Harold C. Zweng, Woodside; Norman A. Peppers, Belmont, and Lloyd E. Alterton, Sunnyvale, all of Calif., assignors to Stanford Research Institute, Menlo Park and Stanford University, Stanford, Calif., part interest to each

Filed May 28, 1970, Ser. No. 41,505
Int. Cl. A61n 5/01
U.S. Cl. 128—395 8 Claims



A combination slit lamp and laser photocoagulator for treating eye disorders in which the laser is coupled to the slit lamp through an articulated arm. The slit lamp optics are arranged such that the laser beam is always in focus at the focus of the slit lamp and one lens in the laser optics is movable so as to vary the point on the eye where the laser impinges. A shutter blocks most of the laser output but permits a small amount to pass for alignment purposes. Means are provided to vary the power of the laser beam which is applied to the eye and indicating means are provided to indicate the amount of power. Means are also provided for varying the spot size of the laser where it impinges upon the eye.

3,703,177

SMOKING PRODUCT AND METHOD OF MAKING SAME

John D. Hind, Richmond, and Matthias F. Kelley, Jr., Bon Air, both of Va., assignors to Philip Morris, Incorporated, New York, N.Y.

Filed Aug. 13, 1970, Ser. No. 63,648
Int. Cl. A24b 03/14
U.S. Cl. 131—2 13 Claims

A smoking product is prepared from waste beet pulp that may be used alone or may be blended with any desired proportion of tobacco. The process comprising the acid hydrolysis of the beet pulp to release beet pectins, and at least an alkaline earth treatment thereafter to cause cross-linking of the pectins and forming a binding agent for the exhausted beet matrix. Preferably a demethylation step on the released pectins is carried out prior to the cross-linking reaction. The final slurry is then dried by known procedures to form a smoking product.

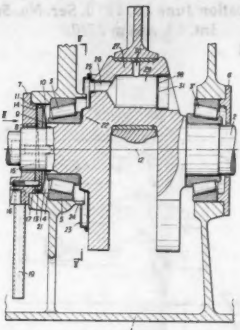
3,703,178

SINGLE-CYLINDER INTERNAL COMBUSTION ENGINE

Erich Schreiber; Fritz Freyn, and John Noraberg, all of Graz, Austria, assignors to Hans List, Graz, Austria

Filed April 22, 1971, Ser. No. 136,507
Claims priority, application Austria, April 24, 1970, A 3794/70
Int. Cl. F01m 1/06
U.S. Cl. 184—6.5 6 Claims

A single-cylinder internal combustion engine comprising a crankshaft running on tapered-roller bearings in the front walls of the crankcase and a vane-type oil pump for the supply of oil to the connecting-rod bearing at the crankpin of the crankshaft, consisting of a rotatively driven ring with a front-end annular groove whose depth diminishes to zero from a point of maximum depth as far as an opposite peripheral point and wherein an elastic pin engages dividing the space defined by the annular groove and an adjacent stationary abutment into a suction chamber impinged upon by oil and a delivery chamber, the latter communicating via an oil drainage hole and oil ducts in the crankshaft with a crossbore of the crankpin ending in the connecting-rod bearing.

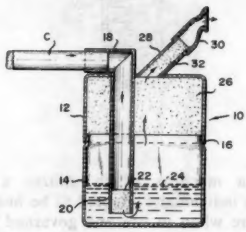


3,703,179

SMOKE FILTERING DEVICE

Jesse L. Nubla, P.O. Box 2556, Manila, Philippines

Filed Nov. 17, 1970, Ser. No. 90,378
Claims priority, application Philippines, July 16, 1970, 1367
Int. Cl. A24f 01/30
U.S. Cl. 131—173 1 Claim



A smoke filtering device for smoking tobacco including a two part receptacle, an inlet to the receptacle, an outlet from the receptacle, a porous filter in the inlet, a porous filter in the outlet, a liquid filter in the receptacle and an additional porous filter in the receptacle above the surface of the liquid filter.

3,703,180

DEVICES FOR APPLYING BEAUTY AIDS TO THE PERSON

Eric Victor Aylott, Welwyn Garden City, England, assignor to Eylure Limited, Welwyn Garden City, England

Filed Dec. 30, 1970, Ser. No. 102,581
Claims priority, application Great Britain, April 2, 1970, 15,681/70; June 23, 1970, 30,466/70; Oct. 15, 1970, 49,072/70
Int. Cl. A45d 40/26
U.S. Cl. 132—88.7 11 Claims

This invention provides a simple and effective device for assisting in the application of beauty aids such as artificial eyelashes, lipstick or eyebrow pencil to the face. The device includes a base member capable of being rested against the chest or bust of the user, a mirror mounted on the base

member, an articulated arm connected to the base member in such a way that the arm may be manipulated by the user and

interchangeable means at the end of the arm for applying different beauty aids.

3,703,181

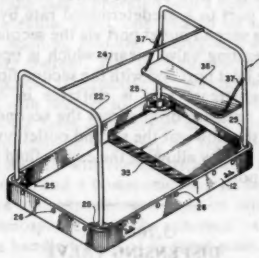
CONVERTIBLE TENT AND LUGGAGE CONTAINER

Dale Tholen, 10706 Cranks Road, Culver City, Calif.

Filed March 1, 1971, Ser. No. 119,529

Int. Cl. A45f *1/00*

U.S. Cl. 135—1 A **3 Claims**



A device which can be fixed to the luggage rack of a vehicle to store and transport items and can be removed from the luggage rack and used as a sleeping enclosure. The device consists of two open rectangular boxes which can be clamped together with their open ends mating to form the luggage container or separated so that each box can be used to form a sleeping enclosure. A mattress may be fitted inside each box. Detachable supporting frames may be mounted on each box to support a tent cover. Nesting blocks of various sizes may be used to level the box on irregular or inclined terrain. The mattresses, frames, tent cover and nesting blocks can be stored in the luggage container.

3,703,182

TELESCOPIC UMBRELLA

Wolfgang Uthemann, and Richard Zimmermann, both of Leichlingen, Rhineland, Germany, assignors to W. Bauermann & Sohne Gmbh, Hilden, Germany, by said Uthemann and Rosenkaimer Gmbh, Leichlingen, Rhineland, Germany, by said Zimmermann

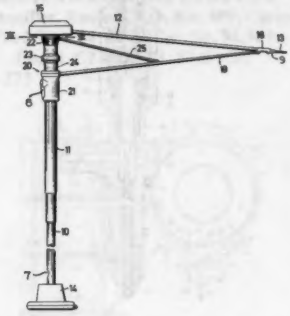
Filed June 5, 1970, Ser. No. 43,704

Claims priority, application Germany, June 7, 1969, G 69 22 739.0; Sept. 5, 1969, P 19 45 098.7

Int. Cl. A45b *19/08, 19/10*

U.S. Cl. 135—25 **19 Claims**

A telescopic umbrella includes a longitudinally extending crown on one end of the main shaft and both main and auxiliary sliders on the shaft. A rib assembly is pivotally secured to the flanks of the crown, main struts extend between the main slider and the rib assemblies and auxiliary struts extend between the main struts and the auxiliary slider. The plane formed by the rib assembly, main strut and auxiliary strut of at



least one frame support unit is twistedly inclined with respect to a plane passing through the longitudinal axis of the shaft so that when the frame is folded these frame elements are not maintained in radial alignment so that the umbrella can be folded more compactly.

3,703,183

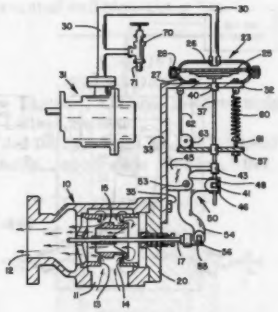
TURBINE SPEED CONTROL

Richard A. Worthen, Greensburg, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 11, 1971, Ser. No. 114,428

Int. Cl. G05d *13/40*

U.S. Cl. 137—47 **1 Claim**



The position of the valve controlling the supply of fluid operating a prime mover, such as a turbine, is determined by a force produced by a speed control mechanism. The level of the applied force is proportional to the speed of the prime mover. A variable force spring and a constant force spring are connected in parallel relation and conjointly opposes the force produced by the control mechanism.

3,703,184

SEALING MEANS FOR FUEL INJECTION VALVES

Friedrich Messerschmidt, Stuttgart-Wellimdorf, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed June 29, 1971, Ser. No. 157,996

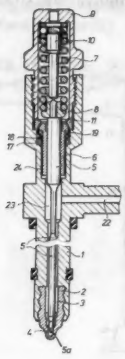
Claims priority, application Germany, June 29, 1970, P 20 32 005.2

Int. Cl. F16k *31/12*

U.S. Cl. 137—509 **5 Claims**

In a fuel injection valve the valve needle is slidably held by a guide sleeve having a spherical head that cooperates with a

spherical support in the valve body to permit a slight swiveling motion of the sleeve and thus a centering of the valve needle with respect to its valve seat. Below its spherical portion, the



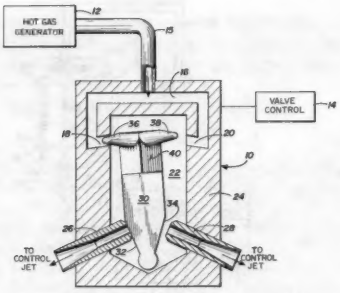
said head is also supported by an internal shoulder of the valve body with the interposition of a metallic ring and an axially and radially sealing packing ring.

3,703,185

FORCE BALANCING FLAPPER VALVE

Joe D. Usry, Arlington, Tex., assignor to E-System, Inc., Dallas, Tex.

Filed April 7, 1970, Ser. No. 26,322
Int. Cl. G05d *16/20;* **F15b** *5/00*
U.S. Cl. 137—82 **9 Claims**



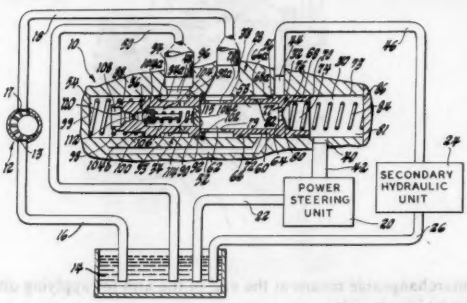
Flapper valves of the type described may be used in a roll control thruster program for rocket maneuvering and the like where relatively small torque motor valve actuators are preferred. The flapper valve inlet is split into two nozzle passages feeding oppositely into a central valve chamber or cavity which contains a pivotally mounted flapper. A conventional pair of oppositely directed outlet passages or ports communicate with the chamber and are opened and closed by the movable flapper. The upstream or inlet section of the flapper is provided with specially shaped poppets to produce force moments which along with force moments produced on the flapper at the outlet ports has a tendency to center the flapper. The upstream or inlet portion of the flapper has an outline such as to effect a reduction of the reaction force of a fluid jet impinging on the upstream section of the flapper. Preferably, the poppets on the upstream section of the flapper are shaped to make the net area of the two upstream nozzle orifices constant for any position of the movable flapper.

3,703,186

FLOW DIVIDER CONTROL VALVE ASSEMBLY

Lee M. Brewer, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 12, 1971, Ser. No. 171,166
Int. Cl. G05d *15/00*
U.S. Cl. 137—101 **4 Claims**



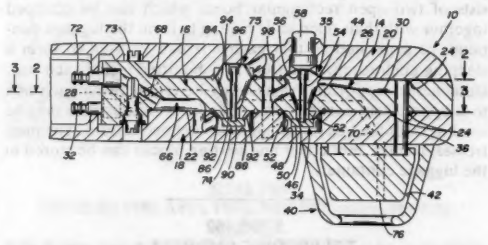
In a preferred form, this disclosure relates to a flow divider control valve assembly for controlling the flow of a fluid from a variable fluid pressure and supply source and which has a flow divider valve means with a first flow control orifice permanently operatively connecting an inlet port with a first or priority outlet port and a second flow control orifice operatively connected with the inlet port. The flow divider valve means is shiftable in response to a predetermined pressure drop across the first flow control orifice to limit the flow out the first outlet port to a predetermined rate by diverting the excess fluid to a second outlet port via the second flow control orifice. An operating valve means which is operatively connected with the inlet port and with the second flow control orifice at its downstream side is shiftable in response to a predetermined pressure drop across the second flow control orifice to limit the flow out the second outlet port to a second predetermined rate by allowing the excess fluid supply to pass out an exhaust port.

3,703,187

DISPENSING VALVE

Jack J. Booth, P.O. Box 10872, Dallas, Tex.

Filed Dec. 11, 1970, Ser. No. 97,220
Int. Cl. B67d *5/56*
U.S. Cl. 137—114 **15 Claims**

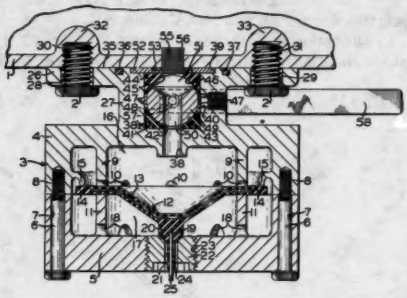


A dispensing valve includes a housing comprising upper, center and lower members, and gaskets positioned between the members. A plurality of water valves and a plurality of corresponding syrup valves are formed in the housing. Each valve includes a portion of one of the gaskets for normally preventing flow between the lower member and the center member of the housing, and a rod for disengaging the gasket portion and thereby permitting flow. The rods of the water valves are activated by pushbuttons mounted in the upper member of the housing while the rods of the syrup valves are actuated by the pressure of water flowing through the corresponding water valves.

3,703,188
AUTOMATIC DRAIN VALVE DEVICE

Daniel G. Wagner, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed March 23, 1970, Ser. No. 21,630
Int. Cl. F16t 1/14
U.S. Cl. 137—204 2 Claims

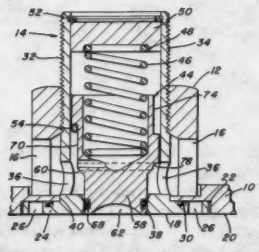


This invention relates to a drain valve apparatus that includes a manually operative means and an automatically operative means arranged in series with the manual means adjacent a storage reservoir from which each is operative to cause the expulsion of contaminants. The manual means comprises a three-position spherical valve having a passageway extending through its center and a valve seat therefor. This valve seat is formed by two identical members each constituting one-half of a cube that is provided with a hemispherical cavity and four semicircular ports, one located on each side of the member and opening into the hemispherical cavity at the outer periphery thereof. The semi-circular ports in the two valve seat members, irrespective of how the two members are arranged one with respect to the other so long as the hemispherical cavities form a spherical cavity for receiving the spherical valve, provide a bearing for receiving a valve stem that is formed integral with the spherical valve to which stem a handle is secured, and a communication through which fluid under pressure and contaminants may be released from the reservoir to atmosphere when the spherical valve is manually rotated by the handle to one of its three positions. When the spherical valve is manually rotated to a second position, it closes the communication to atmosphere and establishes a communication between the reservoir and the automatically-operative means. In its third position, the spherical valve closes both of the above-mentioned communications.

3,703,189
DRAIN VALVE

Floyd G. Koller, Dayton, Ohio, assignor to Auto-Valve, Inc., Dayton, Ohio

Filed Jan. 31, 1969, Ser. No. 795,458
Int. Cl. F16k 31/528, 43/00
U.S. Cl. 137—329.06 8 Claims

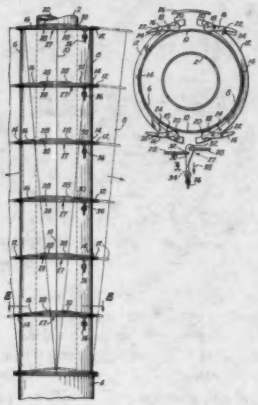


A drain valve is so designed that its primary seal can be removed and replaced without substantial loss of fluid through its drain port. For this purpose, the valve member carrying the primary seal has a secondary seal adapted to close the drain port.

3,703,190
BREAKAWAY CONDUCTOR PIPE

William N. Schoeffler, Route 1, P.O. Box 389, Carencro, La.

Filed Sept. 24, 1970, Ser. No. 74,965
Int. Cl. C21b 33/03; F16l 9/22
U.S. Cl. 137—375 3 Claims

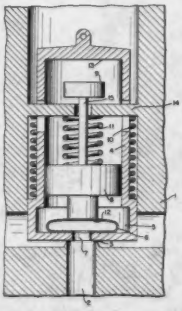


A pair of semicylindrical conductor pipe sections are butted along their edges and releasably clamped around an upstanding well casing in a body of water. The clamped pipe sections can be released from a remote location, to fall away from the well casing and expose a portion of the latter for cutting and sealing in the event of well blow-out or fire.

3,703,191
VALVE DEVICE

Staffan Walter Ekstrom, Lidingo, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Dec. 23, 1970, Ser. No. 100,960
Claims priority, application Sweden, Dec. 23, 1969, 17812/69
Int. Cl. F16k 31/12
U.S. Cl. 137—494 4 Claims



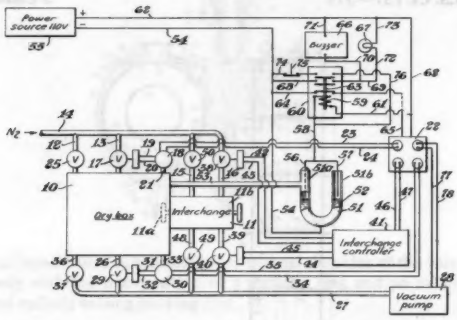
A valve device comprising a valve housing with a feeding channel, the inlet of which has a valve seat and a balanced valve member arranged to contact said valve seat. The valve is provided with an inner pressure sensitive chamber which is connected with the inlet via an opening in the chamber walls. The pressure sensitive chamber is arranged to operate the valve body in the opening direction and bring it out of balance at a predetermined pressure.

3,703,192

ALARM AND SAFEGUARD SYSTEM FOR A CONTROLLED ENVIRONMENT BOX

Gerald R. Staudacher, Bay City, and Sidney W. Ames, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 29, 1971, Ser. No. 110,805
Int. Cl. G04c 23/00; G05b 19/00; C06b 21/02
U.S. Cl. 137—554 5 Claims



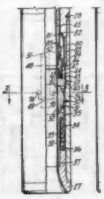
An alarm and safeguard system is disclosed which is particularly adapted for use with an automatically operated, controlled environment box, usually referred to as a "dry box." A manometer partly filled with mercury is in direct communication with the dry box and is electrically connected to a power source and to an electromagnetic relay. If the pressure in the dry box atmosphere drops below or rises above a pre-set safe operating level, the mercury in the manometer will contact one of the electrical connections to the relay and thereby energize the relay. Energizing of the relay completes a circuit through an alarm system comprising a buzzer and a light. Activation of the buzzer and the light thereby provides both an audible and a visible signal which draws attention to the abnormal pressure condition in the box.

3,703,193

VALVES

George Max Raulins, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 28, 1970, Ser. No. 102,004
Int. Cl. F16k 11/16
U.S. Cl. 137—630 18 Claims



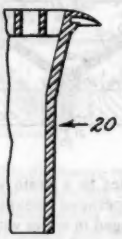
A valve of the type wherein the valve closure member is operable by an actuator member movable longitudinally of a flow passage in the valve housing for opening and closing off flow through the passage, and particularly a rotary valve having a closure member rotatable between opened and closed positions with respect to a longitudinally movable tubular seat member having an external equalizing valve member thereon by means of which pressures are equalized on opposite sides of the valve closure member and the movable seat before movement of the valve closure member occurs in either opening or closing the valve, and wherein the equalizing valve has a smaller area exposed to the pressure in the flow passage to permit the equalizing valve to be moved from closed to open position before the rotary valve is opened whereby a lesser force is needed to fully open the valve.

3,703,194

RESILIENT CONNECTOR

Louis Giordano, P.O. Box 394, Califon, N.J.

Continuation-in-part of Ser. No. 846,800, Aug. 1, 1969, abandoned. This application July 30, 1970, Ser. No. 59,609
Int. Cl. F16l 31/00
U.S. Cl. 138—109 3 Claims



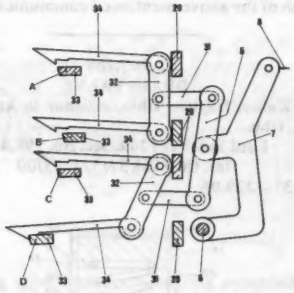
A resilient connector suitable for use on sheet metal which comprises an integral resilient plastic molding having a lower tubular section and a pair of flanges at its top extremity. The edges of an opening in sheet metal are grasped between the flanges. Preferably a grid is molded integrally with the top end of the device, and assumes a position substantially flush with the sheet metal.

3,703,195

HEDDLE FRAME LIFT DEVICE

Rudolf Schwarz, Horgen-Zurich, Switzerland, assignor to Staubli AG, Horgen-Zurich, Switzerland

Filed Aug. 12, 1970, Ser. No. 63,090
Claims priority, application Switzerland, Aug. 13, 1969, 12283/69
Int. Cl. D03c 1/06
U.S. Cl. 139—71 3 Claims



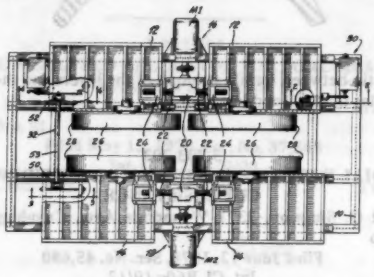
High-speed heddle frame lift device, also known as a shed forming apparatus, in which the control times for the draw members amount up to two rotations of the drive heddle frame of the loom. Each heddle frame lift unit is composed of several known shed forming devices which are arranged parallel and one behind the other. While one heddle frame lift device releases the heddle frame lift, the second heddle frame lift device is being controlled for the next lift.

3,703,196

SYSTEM FOR CONTROLLING THE SETTING OF A QUADRUPLE BAND SAW

Constantin Hedrei, Montreal, Quebec, Canada, assignor to Forano Limitee, Montreal, Quebec, Canada

Filed Oct. 16, 1970, Ser. No. 81,380
Int. Cl. B27b *15/08*
U.S. Cl. 83—806 9 Claims



A system for controlling the setting of a quadruple band saw having a fixed frame, a pair of rear and a pair of front sliding bases slidably mounted on the fixed frame and respectively supporting a pair of saw blades, and a drive unit for operating each pair of sliding bases in synchronism. The system comprises a first device for controlling the drive unit of the rear pair of sliding bases, and a second device for controlling the drive unit of the front pair of sliding bases to adjust the distance of the front pair of saw blades with respect to the rear pair of saw blades when the rear pair of saw blades is stationary and for maintaining a relative distance between the front and rear pairs of saw blades when the rear pair of saw blades is moving.

3,703,197

CARPET BACKING

Lee F. Samler, Baltimore, and John J. Boone, Ellicott City, both of Md., assignors to Esso Research and Engineering Company

Filed May 13, 1971, Ser. No. 143,251
Int. Cl. B32b *27/08*; D06n *7/00*
U.S. Cl. 117—138.8 E 4 Claims

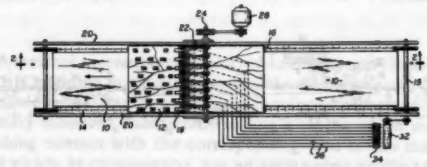
A woven polypropylene ribbon carpet backing is provided having a special coating consisting essentially of 18 – 23 parts of butyl rubber, 6 – 8 parts of polyoxyethylene lauryl alcohol, up to 1 – 5 parts stearate lubricant, up to 2 parts polyethylene glycol and 5 – 6 parts of calcium carbonate.

3,703,198

APPARATUS FOR MAKING TEXTURED PANELS

Donald F. Luebs, Vienna, Va., and Frederick R. Ashby, Red Oak Ridge, N.Y., assignors to Champion International Corporation

Division of Ser. Nos. 759,624, Sept. 13, 1968, and Ser. No. 35,011, May 6, 1970, Pat. No. 3,616,826, and Ser. No. 118,666, May 6, 1970. This application Feb. 25, 1971, Ser. No. 118,665
Int. Cl. B27c *5/06*
U.S. Cl. 144—2 R 6 Claims



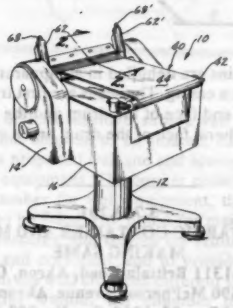
This invention pertains to the method, and/or apparatus for rapidly producing the same so that fibrous board products including plywood panels would appear to simulate an adze surfaced product having a rustic appearance. The "distressing" or cutting of the product may be minimal or partial distressing or may be total distressing including overlapping cuts, or cuts within previous cuts.

3,703,199

AUTOMATIC BLADE CONTROL MECHANISM FOR MEAT SKINNING MACHINES

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Continuation-in-part of Ser. No. 706,941, Feb. 20, 1968, Pat. No. 3,559,707, which is a continuation-in-part of Ser. No. 616,692, Feb. 16, 1967, abandoned. This application April 9, 1970, Ser. No. 26,987
Int. Cl. A22c *17/12*
U.S. Cl. 99—589 16 Claims



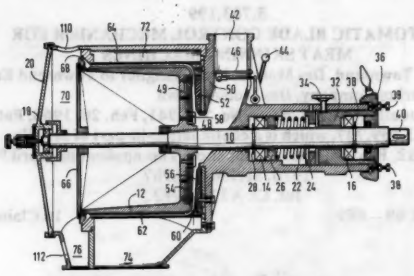
An automatic blade control mechanism for meat skinning machines comprising a laterally extending skin gripping roll having a cutting blade movably positioned adjacent thereto. A power means is connected to the gripping roll to cause the rotation thereof so that a layer of meat can be moved rearwardly towards the cutting blade to separate a layer of skin from the meat. A blade control means is connected to the opposite ends of the cutting blade to cause the cutting blade to automatically move into a cutting position upon engagement with the meat. Each of the blade control means comprises an end plate secured to the end of the cutting blade and having a biased support means connected thereto which yieldably resists the upward movement of the cutting blade away from the gripping roll. A support arm is secured to the support means and is operatively connected to a crank arm having its axis of rotation below and forwardly of the rotational axis of the gripping roll. The rearward end of the crank arm is pivotally connected to the upper end of a spring loaded rod which is pivotally and slidably connected adjacent its lower end to a control lever. The control lever may be selectively pivotally moved to a first position whereby the cutting blade is moved outwardly and rearwardly from the gripping roll for cleaning purposes. The control lever is yieldably normally positioned in a second position wherein the cutting blade is in a position to move into its cutting position. The engagement of the cutting blade by the meat causes the support arm and the crank arm to be pivotally moved thereby causing the spring loaded rod to yieldably and slidably move downwardly, against the spring resistance imposed thereon, with respect to the control lever to permit the cutting blade to move into its cutting position to separate the layer of skin from the meat. The instantaneous initial bite of the cutting blade into the meat is enhanced and accelerated by pivoting the cutting blade from its position adjacent the gripping roll rearwardly and downwardly into its cutting position.

3,703,200

TREATING CEREAL GRAINS AND SEEDS

Leslie Palyi, 23 Larabee Cres., Don Mills, Ontario, Canada, and Helge Larsen, Asaa, Jutland, Denmark

Filed July 28, 1970, Ser. No. 58,798
Claims priority, application Germany, July 28, 1969, P 19 38 328.9
Int. Cl. B02b *3/00*
U.S. Cl. 99—233.8 **26 Claims**



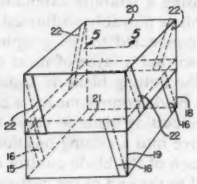
Seeds and grains are dehulled in an apparatus comprising a drum rotating in a casing. The seeds are first treated in a radial gap between an end face of the drum and the casing and then between a peripheral face of the drum and a surrounding part of the casing.

3,703,201

FLEXIBLE FABRIC CONTAINER AND METHOD OF MAKING SAME

William Musyt, 1311 Brittain Road, Akron, Ohio, and James D. Tremelin, 490 McPherson Avenue, Akron, Ohio

Filed Dec. 22, 1969, Ser. No. 887,178
Int. Cl. B65d *81/00*
U.S. Cl. 150—0.5 **3 Claims**



A method of making an improved flexible crash resistant fabric container, the building steps comprising coating the fabric with an elastomeric material without obtaining penetration of the elastomeric material into the interstices of the fabric and plying up the fabric over the building form, wherein the seams are placed at least one inch away from corners and the other seams in the multiplied construction and the seam area is formed by overlapping at least one inch.

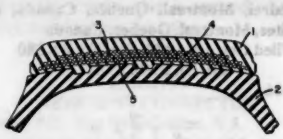
3,703,202

TREAD RING FOR REMOVABLE TREAD TIRES

Luigi Maiocchi, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed March 3, 1971, Ser. No. 120,653
Claims priority, application Italy, March 12, 1970, 21827
Int. Cl. B60c *11/02*
U.S. Cl. 152—175 **2 Claims**

A tread ring for removable tread tires which is provided with a tension-resistant armor formed by a helically wound metal cord having coils disposed substantially parallel to the mid-circumferential plane of the tire. This structure is provided with layers disposed radially inwardly and outwardly of the armor. The layers embody metal cords disposed parallel to one another in each layer and extend along two directions crossed relative to the mid-circumferential plane of the tire.



The ratio between tensile strength of the layers and the armor is greater than 0.3 and less than 1.

3,703,203

RADIAL WIRE TIRE HAVING IMPROVED SIDEWALL CUT RESISTANCE

Robert O. Simpson, 2371 Wyandotte Ave., Cuyahoga Falls, Ohio

Filed June 12, 1970, Ser. No. 45,680
Int. Cl. B60c *19/12*
U.S. Cl. 152—354 **6 Claims**

Radial wire tire having four plies of unstretched nylon tire cord fabric disposed in the sidewalls thereof midway between the wire carcass and the outer surface of the sidewall at an angle of between 80° and 88° and extending substantially from the bead portion to the shoulder portion of the tire.

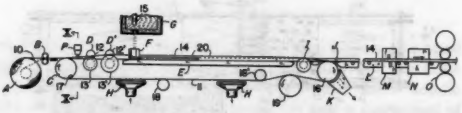
The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full nature and extent of the technical disclosure of this application, reference must be made to the accompanying drawing and the following detailed description.

3,703,204

INTEGRATED IN-LINE METHOD OF CONTINUOUSLY CASTING METAL

David W. Brownstein, 5437 Ellsworth Avenue, Pittsburgh, Pa.

Filed Oct. 27, 1970, Ser. No. 84,341
Int. Cl. B22d *11/06*
U.S. Cl. 164—87 **12 Claims**



Direct casting of molten metal such as steel is accomplished by forming a trough-shaped mold or mold liner of ablative

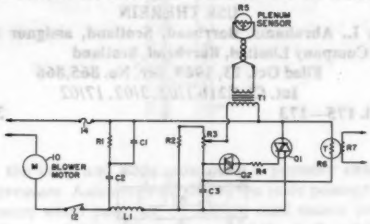
material and by advancing it forwardly past a molten metal feed station and along a casting line. The shaped material is charred with the molten metal and is employed in its charred condition as an immediate trough shaped mold or mold surface for the molten metal being cast. External means is employed for supporting the charred mold-shaped ablative and advancing it horizontally forwardly with the metal being cast therein.

3,703,205

BLOWER-SPEED REGULATOR FOR FORCED-AIR HEATING SYSTEMS

James A. Verden, 315 South Evanston Avenue, Arlington Heights, Ill.

Filed May 15, 1970, Ser. No. 37,545
Int. Cl. F25b *29/00*
U.S. Cl. 165—26 **2 Claims**



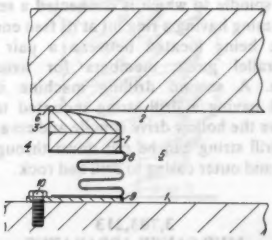
Blower speed is modulated in accordance with plenum temperature by a circuit employing a thermistor transformer-coupled to a semi-conductor power-control circuit regulating power input to the blower motor of a warm-air furnace. The thermistor speed modulation is automatically disabled when the blower is employed for air-conditioning.

3,703,206

THERMAL REGENERATORS

Mark Cary Sedgwick Barnard, Kenilworth, England, assignor to Leyland Gas Turbines Limited, Solihull, England

Filed July 6, 1971, Ser. No. 159,925
Claims priority, application Great Britain, Aug. 15, 1970, 39461/70
Int. Cl. F28d *19/04*
U.S. Cl. 165—9 **3 Claims**



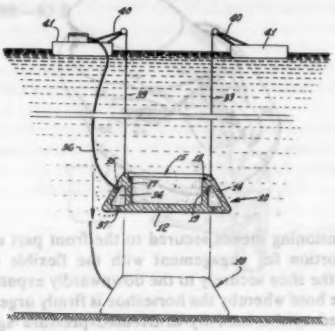
A thermal regenerator of the kind having a rotary disc-type matric enclosed in a casing traversed by two segregated flows of gaseous heat-exchanging fluids is equipped with an annular flexibly mounted counterface sealing element which makes rubbing contact with the corresponding face of the matrix, and which, in cross-section, has an asymmetric profile tapering from maximum thickness adjacent to the high-pressure side of the sealing element to minimum thickness at the low-pressure side.

3,703,207

SUBSEA BUNKER CONSTRUCTION

Edward E. Horton, Portuguese Bend, Calif., assignor to Deep Oil Technology, Inc., Long Beach, Calif.

Filed July 29, 1970, Ser. No. 59,055
Int. Cl. E21b *7/12*
U.S. Cl. 166—.5 **8 Claims**



A protective, oil leak sensitive, subsea well bunker and template construction adapted to be floated, carried, barged or transported to a proposed well site and lowered to a sea floor without special equipment. The bunker construction provides an enclosed chamber for well equipment, the well chamber being adapted to be filled with liquid for maintaining subsurface ambient pressures, and treated for reducing and inhibiting marine life and corrosion, and to provide a selected environment within the well chamber different than the environmental conditions without the chamber to facilitate and enhance working and service conditions within the chamber. The bunker construction includes means for sensing the presence and absence of oil in the chamber.

3,703,208

REDUCTION OF RADIOACTIVE GAS CONTAMINATION OF NUCLEAR DETONATIONS IN GEOLOGICAL FORMATIONS

Richard A. Heckman, Castro Valley, and John O. Cowles, Livermore, both of Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Jan. 22, 1971, Ser. No. 108,976
Int. Cl. E21b *43/00*
U.S. Cl. 166—247 **7 Claims**

Oxidizing agents are disposed circumjacent to a nuclear explosive device detonated in a geological formation, generally a carbonaceous or petroliferous formation, to provide a more oxidizing environment thereabout. Upon detonation of the device reductants present in the formation as well as in emplacement components are oxidized. Consequently tritium produced by the detonation together with any hydrogen gas present tends to be oxidized to form a tritiated water product. The water combines with inorganic materials in the vicinity of the detonation and is immobilized or falls to the bottom of the detonation produced cavity so as to minimize the tritium content of organic materials evolved by the formation.

3,703,209

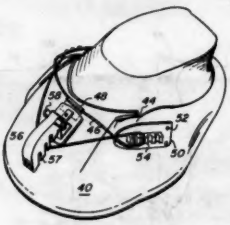
ADJUSTABLE BOOT TYPE COMPOSITION HORSESHOE

Neel W. Glass, Los Alamos, N. Mex., assignor to Les-Kare, Inc., Pajarito Acres, N. Mex.

Filed Nov. 27, 1970, Ser. No. 93,119
Int. Cl. A01l *3/00, 5/00*
U.S. Cl. 168—18 **4 Claims**

A molded composition boot type horseshoe having a tread portion shaped to cover the entire bottom of a horse's hoof

and a flexible upwardly extending envelope portion shaped to conform to the lateral walls of a horse's hoof and having a pair of triangular folds in the front portion to provide contractual flexibility, and an adjustable tensioning member being a continuous flexible cable which is fastened at the ends to opposite sides of the upper part of the envelope portion and an over



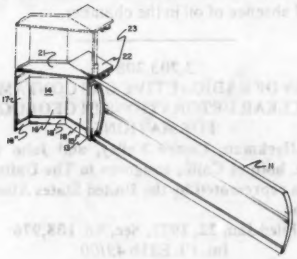
center tensioning means secured to the front part of the envelope portion for engagement with the flexible cable for snugging the shoe securely to the downwardly expanding portion of the hoof whereby the horseshoe is firmly urged upward and affixed to the hoof by distributed pressure against the aforesaid downward expanding portions of the hoof, the back of the horse's foot and the sole of the hoof.

3,703,210

MOLD BOARD MATERIALS GATE FOR MOTOR PATROLS

Ray J. Williams, deceased, late of Route 3, P.O. Box 74C, Moscow, Idaho (by Marion Williams, administratrix), and Raymond R. Miller, Route 3, P.O. Box 74C, Moscow, Idaho

Filed June 28, 1971, Ser. No. 157,142
Int. Cl. E02f *3/12*; E01h *5/00*
U.S. Cl. 172—784 **4 Claims**



The invention comprises a substantially hook-like materials gate including a moldboard wall, a collector wall and materials wall disposed distally at one of the terminal ends on the materials engaging side of a moldboard of a commonly known motor patrol, and a materials diverter carried between the moldboard and the moldboard wall of the materials gate. The materials gate may be operable to be selectively raised and lowered relative to the moldboard of the motor patrol in response to fluid or air under pressure supplied from a suitable source by means such as hydraulic or pneumatic cylinders.

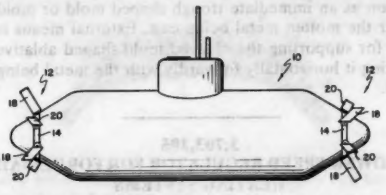
3,703,211

PROPELLER WITH AFTER-COLLISION PROPULSION CAPABILITY

Henry J. Bernaerts, Amberley, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 31, 1970, Ser. No. 103,232
Int. Cl. B63h *5/18*
U.S. Cl. 115—34 R **2 Claims**

A propeller with two complete sets of blades on the same hub. One set has long blades, the other short, so that in the event of collision with an object the longer blades will be the



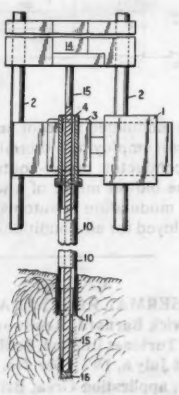
first to suffer damage thereby leaving the shorter blades undamaged and able to propel the vehicle.

3,703,212

METHOD OF ROCK DRILLING AND APPARATUS FOR USE THEREIN

Joseph L. Abrahams, Barrhead, Scotland, assignor to Rock Fall Company Limited, Barrhead, Scotland

Filed Oct. 13, 1969, Ser. No. 865,866
Int. Cl. E21b *1/02, 3/02, 17/02*
U.S. Cl. 175—173 **3 Claims**



Method and apparatus for drilling overburden covered rock which may or may not be submerged. The apparatus comprising a first drilling machine having a rotary drill head with a hollow drive spindle to which is connected a sectional cylindrical outer casing having a ring bit at its free end. The hollow drive spindle being located between a pair of vertically disposed parallel guide members for axial movement therebetween. A second drilling machine independently operable and having a drill string mounted to the drilling machine above the hollow drive spindle and co-axial therewith so that the drill string can be put down through the hollow drive spindle and outer casing to drill bed rock.

3,703,213

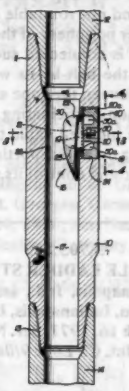
MUD SAVER APPARATUS

Archer W. Kammerer, Jr., Fullerton, and Gary R. Johnson, Anaheim, both of Calif., assignors to Baker Oil Tools, Inc., Los Angeles, Calif.

Filed Oct. 21, 1970, Ser. No. 82,757
Int. Cl. E21b *33/00*
U.S. Cl. 175—318 **10 Claims**

Mud saver apparatus to be disposed at the lower end of a kelly adapted to be secured to a string of drill pipe and to pass through a rotary table, which can rotate the kelly, drill pipe, and bit secured thereto, for the purpose of drilling a bore hole in a formation while drilling mud is being pumped through the

kelly drill pipe and bit, the apparatus including a tubular body and an elastic bladder disposed across the body passage by a gas under pressure to close the passage when drilling mud or other fluid is not being pumped through the kelly, but which is deflected to passage opening position by drilling mud pumped



through the kelly and body passage at a pressure exceeding the gas pressure. Automatic closing of the body passage by the gas pressure when pumping of drilling mud ceases prevents the drilling mud from dropping out of the kelly when it is disconnected from the drill pipe therebelow.

3,703,214

ROCK DRILLING BIT

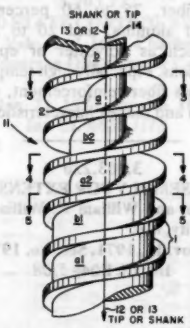
Otto Boehm, Starnberg, and Werner Scholz, Soecking, both of Germany, assignors to Werkzeugbau GmbH, Starnberg, Germany

Filed March 1, 1971, Ser. No. 119,783

Claims priority, application Germany, March 26, 1970, P 20 14 870.3; Aug. 25, 1970, P 20 41 985.6

Int. Cl. E21c *13/08*

U.S. Cl. 175—395 **11 Claims**



The present rock drilling bit comprises along its shaft portions of asymmetrical cross sectional areas for strengthening the drilling bit. These asymmetrical portions are distributed along and around the central axis of the shaft in such a manner that a curve which interconnects the surface centers of gravity of these portions which are located off said central axis, forms a spiral helix. These portions may be located in preferred sections of the drill bit shaft, especially in a transitionary section between the tip of the drill bit and the shaft proper or in another transitionary section between the shaft and a shank of the drilling bit.

3,703,215

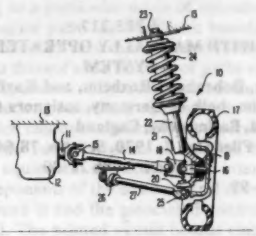
INDEPENDENT FRONT SUSPENSION SYSTEM FOR A FRONT WHEEL DRIVE AUTOMOBILE

Mitsuo Takahashi, Ohta, Japan, assignor to Fuji Heavy Industries, Ltd., Tokyo, Japan

Division of Ser. No. 836,725, June 26, 1969, Pat. No. 3,642,084. This application Oct. 7, 1971, Ser. No. 187,260

Int. Cl. B60k *17/30*

U.S. Cl. 180—43 R **2 Claims**



A front wheel drive automobile has an axially non-extensible and non-contractable drive shaft connected at one end with the output shaft of a differential gear unit mounted on the vehicle body through an inboard universal joint and its other end with an axle of a wheel assembly through an outboard universal joint. A bearing housing rotatably supports the axle, a ball joint is provided on the bearing housing at a position beneath the axle and a post is connected at one end with the bearing housing ball joint and at the other end with a resilient member mounted on the vehicle body at a position rearward and inboard with respect to the ball joint and located at a position higher than that of the ball joint in the normal running state to provide a nose-down effect under vehicle acceleration.

3,703,216

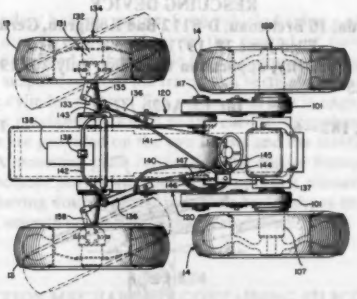
TRACTOR DRIVE CONVERSION

John L. Thibodeau, Tampa, Fla., assignor to Standard Alliance Industries, Inc., Chicago, Ill.

Division of Ser. No. 811,728, April 1, 1969, Pat. No. 3,620,321. This application June 30, 1971, Ser. No. 158,359

Int. Cl. B60k *17/30*

U.S. Cl. 180—44 R **10 Claims**



There is disclosed a means to convert a conventional two wheel drive tractor to four wheel drive utilizing the original tractor power unit, the transmission-differential and the frame comprising two walking beam frame assemblies connected to the original rear drive axle, each housing a sprocket for a front wheel, a sprocket for a rear wheel, a means to drive these wheels, and a chain to take the power from the drive means and transfer it to the wheel sprockets. The drive sprocket is connected to the tractor rear axle transmission-differential on each side of the tractor so that the power from the tractor is

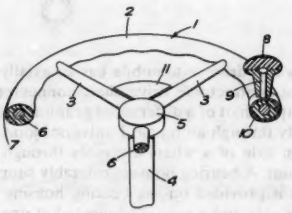
transmitted to the front and rear wheel sprockets by the continuous chain. A ball joint is added to each wheel which is connected to the wheel sprocket in the frame, a hydraulic cylinder is connected to each ball joint with a steering arm allowing the wheel to be steered hydraulically. A vertical hydraulic cylinder is connected to a yoke which extends over the hood of the tractor allowing the power unit to be raised or lowered hydraulically without affecting the plane of the four wheels of the tractor and acting as an oscillator on the front wheels.

3,703,217

VEHICLE WITH MANUALLY OPERATED STEERING SYSTEM

Bruno Kulick, Bobenheim/Roxheim, and Karlheinz Lamneck, Beindersheim, both of Germany, assignors to Lansing Bagnall Limited, Basingstoke, England

Filed Oct. 7, 1970, Ser. No. 78,649
Int. Cl. G08b 21/00
U.S. Cl. 180—99 **7 Claims**



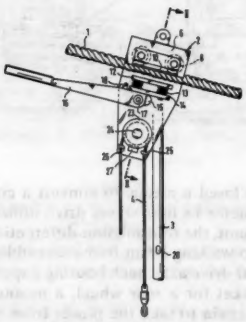
A vehicle has a manually operated steering system controlled by a steering handle, there being mounted on the steering handle an operating element which, in the event of a sudden disability of the driver, effects operation of a shutting-down system on the vehicle. The operating element comprises an electrical conductor mounted on the steering handle and functioning as a capacitive transmitter which constitutes the active capacitance in a capacitive bridge circuit for detecting a change in the effective capacitance of the capacitive transmitter, according to whether or not a driver's hand is on the steering handle. The bridge circuit operates a relay which switches off the vehicle circuits and also controls an hydraulic ram assembly which acts on a brake when the relay is operated.

3,703,218

RESCUING DEVICE

Otto Brda, 10 Breitenau, D-8112 Bad Kohlgrub, Germany

Filed June 28, 1971, Ser. No. 157,516
Claims priority, application Germany, July 20, 1970, P 20 35 933.5
Int. Cl. A62b 1/14
U.S. Cl. 182—6 **11 Claims**



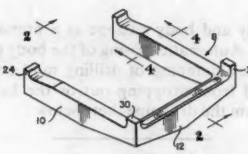
Rescuing device for rescuing persons from the chairs of inoperative chairlifts or the like in which on a supporting member rollers are provided, against which the cable carrying the chairs is pressed by a braking plate, said braking plate being movable on the supporting member in a direction normal to the extension of the cable. On the braking plate spring means are acting, which can be compressed by an adjustable lever. On the supporting member there is provided a cylinder, supported by a free-wheeling bearing rotatable in one direction of rotation and not rotatable in the other. A rope is wound around the outer periphery of the cylinder and to a first end of the rope a belt is connected such that a person to be rescued and sitting in the belt by its weight generates a frictional braking force between the rope and the outer periphery of the cylinder. A person participating in the rescuing operation can slide down an inclined cable to which the chairs are connected, while sitting on a transporting means connected to the supporting member and control its speed by operating the adjustable lever.

3,703,219

MANHOLE LADDER STEP UNIT

David P. Jones, Indianapolis, Ind., assignor to Construction Products Corporation, Indianapolis, Ind.

Filed March 16, 1971, Ser. No. 124,679
Int. Cl. E06c 9/04
U.S. Cl. 182—46 **8 Claims**



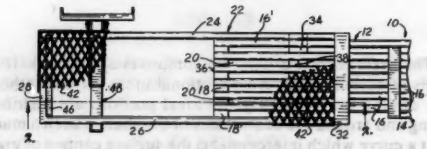
A non-metallic manhole ladder step unit of high-strength plastic molding composition, having spaced cantilevered side beams to be embedded in a wall and a cross beam to form a ladder step. High strength and good molding characteristics are obtained by forming the beams with longitudinal walls which are vertically deep but transversely thin, joined in an inverted-U or other mutually reinforcing relation. For best characteristics, a thermosetting molding composition is used, containing at least 20 percent and preferably 30 to 50 percent reinforcing glass fiber, 25 to 60 percent mineral filler, preferably hydrated alumina, and 20 to 50 percent thermosetting resin, such as polyester or epoxy resin. Thermoplastic compositions, especially high temperature compositions containing glass fiber reinforcement, may also be used when lower strength and flame characteristics are acceptable.

3,703,220

EXTENDER ASSEMBLY FOR EXTENSION PLANKS

Charles P. Williams, and William K. Williams, both of P. O. Box 48, Golden City, Mo.

Filed Nov. 11, 1971, Ser. No. 197,731
Int. Cl. E04g 5/08
U.S. Cl. 182—223 **8 Claims**



A longitudinal extender assembly for telescoping slatted extension planks which have a plurality of transversely spaced, longitudinal members. The extender assembly includes a U-shaped frame having sidebars fitting alongside the outer members of the extension plank, and top and bottom transverse

crosspieces located at the open end of the frame. One end of the plank is insertable between the crosspieces so that the extender projects longitudinally from the plank to increase the length thereof.

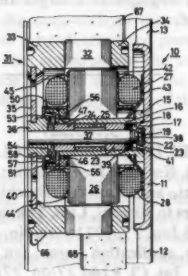
ERRATUM

For Class 184—6.5 see:
Patent No. 3,703,178

3,703,221
LUBRICATION DEVICE FOR ROTATING MACHINE PARTS

Alfred Merkle; Volker Schlicker, both of St. Georgen, and Gunter Wrobel, Villingen, all of Germany, assignors to Papst-Motoren KG, St. Georgen, Germany

Filed Dec. 24, 1970, Ser. No. 101,226
Claims priority, application Germany, Dec. 24, 1969, P 19 64 889.6
Int. Cl. F16n *31/02*
U.S. Cl. 184—6.27 **26 Claims**

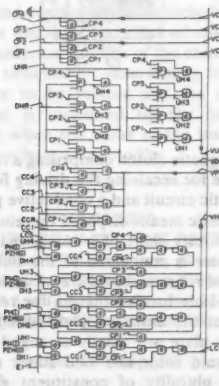


Lubrication device for lubricating a rotating machine part wherein a rotatable centrifuging ring is provided for centrifuging lubricants escaping along the rotating part back toward an absorbent body which is in liquid communication with a lubricant reservoir, thus passing escaping lubricant back to the lubricant reservoir.

3,703,222
SOLID STATE CONTROL SYSTEM

John Lusti, River Vale, and John Charles Doane, Somerset, both of N.J., assignors to Otis Elevator Company, New York, N.Y.

Filed Jan. 21, 1971, Ser. No. 108,549
Int. Cl. B66b *1/18*
U.S. Cl. 187—29 R **64 Claims**

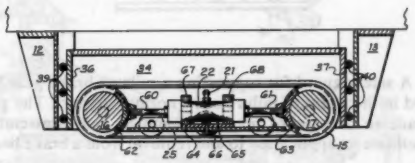


Improved solid state control systems for elevators in which the solid state components are mounted on printed circuit boards, the conductor paths of which interconnect the components of each individual board and connect them to circuit terminals which enable the connections of various components on different boards to each other. A first plurality of printed circuit boards whose components are properly interconnected provides basic control circuitry for one elevator car operating in a single car system. When appropriately connected to the control equipment associated with its car so as to receive control signals therefrom this circuitry operates in response to such signals in a predetermined manner to control its car according to a particular mode of operation. Included among the conductor paths on the circuit boards of this first plurality and connected between circuit terminals and solid state components thereof are a number of paths which are unnecessary to the operation of the basic control circuitry. These enable the connection of auxiliary equipment to the basic control circuitry which causes that circuitry to operate differently in response to the control signals it receives from the associated control equipment even though the interconnections between the components of the basic control circuitry and the connection between it and the associated control equipment remain unaltered. The printed circuit boards employed in supervisory control systems for groups of elevator cars possess a similar such universal character.

3,703,223
VEHICLE SECONDARY BRAKING SYSTEM WITH CONTINUOUS BELT

Alexander G. P. McInnes, Indianapolis, Ind., assignor to International Research & Development Corporation, Indianapolis, Ind.

Filed Oct. 2, 1970, Ser. No. 77,576
Int. Cl. B60t *1/14*
U.S. Cl. 188—5 **4 Claims**



A secondary braking system for a vehicle having a continuous belt directly engageable with the ground or pavement. Two brackets fixed to the vehicle frame slidingly engage a carrier body suspended from the frame and vertically movable by hydraulic cylinder motors. The continuous belt is engaged on two drums rotatably mounted to the carrier. Complementary serrations are provided on the two drums and the interior belt surface. A mounting plate fastened to the carrier between the top and bottom portions of the belt supports a master brake cylinder having double piston rods with brake shoes engageable with a smooth portion of each serrated drum.

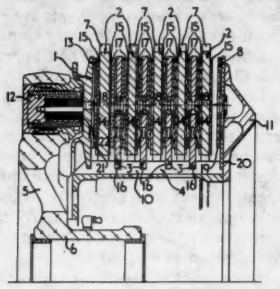
3,703,224
FRICTION MECHANISMS CONTAINING SILICON NITRIDE

Horace A. Bray, Coventry, England, assignor to The Dunlop Company Limited, London, England

Filed Feb. 27, 1970, Ser. No. 15,144
Claims priority, application Great Britain, March 6, 1969, 11,904/69
Int. Cl. F16d *69/02*
U.S. Cl. 188—251 M **5 Claims**

A friction mechanism comprising an assembly of two relatively rotatable friction members, wherein the engaging surfaces of both friction members are provided with a sintered

friction material, at least one of the friction members containing silicon nitride as a constituent. The friction material may



also contain graphite and other friction and wear modifying agents such as molybdenum disulphide tin and lead, of which the following is a specification.

3,703,225

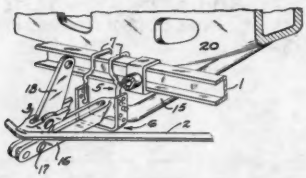
RAILWAY BRAKE GEAR BOTTOM ROD GUARD

Irvin J. Spaeth, Chicago, Ill., assignor to Evans Products Company, Plymouth, Mich.

Filed Dec. 28, 1970, Ser. No. 101,551

Int. Cl. B61h *13/38*

U.S. Cl. 188—210 **10 Claims**



A safety guard for supporting a railway brake gear bottom rod in the event of failure of its normal support. The guard is made in two pieces readily assembled and disassembled to facilitate its application to and removal from a brake beam.

3,703,226

SHIFTABLE FRICTION CLUTCH

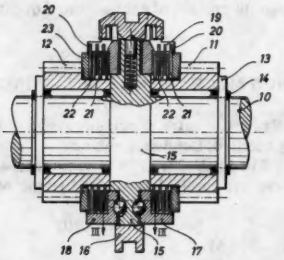
Richard Strehler, Unterfohring; Hans Eichinger, and Julius Hubl, both of Munich, all of Germany, assignors to Carl Hurtl, Maschinen-und Zahnradfabrik, Munich, Germany

Filed Feb. 8, 1971, Ser. No. 113,505

Claims priority, application Germany, Sept. 14, 1970, P 20 45 383.2

Int. Cl. F16d *21/06, 13/42*

U.S. Cl. 192—48.91 **17 Claims**



Friction clutch means including interleaved compressible friction plates and selectively operable means effecting compression thereof. One aspect of the invention relates to the means utilizing torque generated between the parts to be clutched for providing the compression force to be applied to the plates. Ball and ramp means are provided between driving and driven parts responding to torque initially applied to the driving member for generating an axial force which is then applied to the plate compressing means. Torque limiting means are provided in the force train to prevent transmission of excessive torques. Positive means are provided for preventing relative movement of the pressure generating parts when the clutch is in the disengaged condition whereby to insure against a tendency for a residual compression force to be applied during idling conditions.

Another aspect of the invention relates to means for shifting the shift collar. Here an eccentric is provided between the arms of a U-shaped yoke, said yoke being connected conventionally to the shift collar. Said eccentric has two pressure points, one on a relatively short radius for bearing against one side of said yoke and a second on a longer radius for bearing against the same side of said yoke upon further rotation of the eccentric. Thus, engagement of the eccentric starts with a smaller radius arm for application of greater force to the yoke and subsequently engages at a larger radius for more rapid movement thereof.

3,703,227

ELECTROMAGNETIC CLUTCH

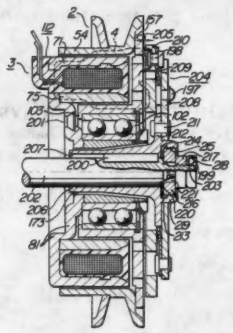
Tadao Murakami, Katsuta; Ken Kikuchi; Riyouzou Tomozaki, both of Hitachi, and Yasushi Ohuchi, Ibaraki-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 27, 1971, Ser. No. 110,032

Claims priority, application Japan, Jan. 30, 1970, 45/8230

Int. Cl. F16d *27/06, 27/10*

U.S. Cl. 192—84 C **5 Claims**



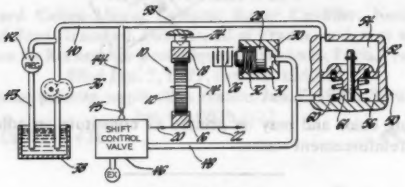
An electromagnetic clutch comprising a rotor having a belt-receiving groove for receiving the driving force from a prime mover, a magnetic circuit and a conductive plate; a stator having electromagnetic means disposed therein; and a clutch disc mounted on a rotary shaft of a rotary machine or the like; wherein said rotor is connected to the stator through a ball bearing, and said rotor and said stator in the assembled state have a through-hole formed therein for receiving the rotary shaft and further the armature plate of said clutch disc and said conductive plate are axially arranged with a slight gap therebetween, said rotor and said stator respectively being made up of a plurality of constituent elements including pressed elements and short pipes which are united together at their contacting surfaces by friction welding.

3,703,228

ACCUMULATOR FOR HYDRAULICALLY OPERATED FRICTION CLUTCH OR BRAKE UNIT

Howard E. Chana, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 17, 1970, Ser. No. 73,127
Int. Cl. F16d 25/00
U.S. Cl. 192—85 R 2 Claims



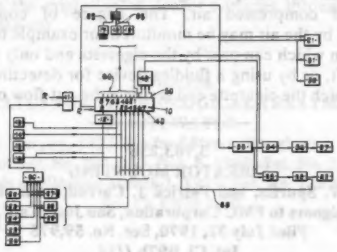
The accumulator, disposed in parallel relationship to the hydraulically operated servo for operating a friction clutch or brake unit, has a double rate accumulator spring which controls the stroke of the accumulator piston operating against the opposing force of a predetermined pressure equivalent to line pressure. With this construction the servo apply force is calibrated to produce smooth shifts in the transmission with the tailored and cushioned engagement of the friction unit.

3,703,229

COIN-OPERATED VENDING MACHINES

David John Bowring, Wolverhampton, England, assignor to G.K.N. Sankey Limited, Bilston, Stafford County, England

Filed Dec. 8, 1970, Ser. No. 96,222
Claims priority, application Great Britain, Dec. 10, 1969, 60,205/69
Int. Cl. G07f 11/00
U.S. Cl. 194—10 10 Claims



A coin-operated vending machine includes a multi-stage binary counter for totalizing the value of coinage inserted into the machine. Numerical outputs of the counter are connected to price setting switches for determining the prices at which commodities are to be vended and the totalized value of coinage inserted is registered by the numerical outputs. Change is given when the value of the inserted coinage exceeds that of the selected commodity.

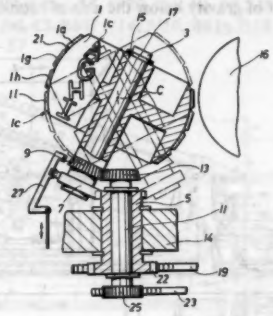
3,703,230

TYPEHEAD SETTING DEVICE

Horst Dieter Glave, Wilhelmshaven, Germany, assignor to Olympia Werke AG, Wilhelmshaven, Germany

Filed April 13, 1971, Ser. No. 133,625
Claims priority, application Germany, April 21, 1970, P 20 19 013.0
Int. Cl. B41j 1/60
U.S. Cl. 197—52 12 Claims

A spherical type head is mounted on a supporting shaft for rotation about a first axis, and the supporting shaft is rotated by line selector means about a second axis intersecting with the first axis at the center of the spherical typehead so that the typehead performs a wobbling motion for placing a selected



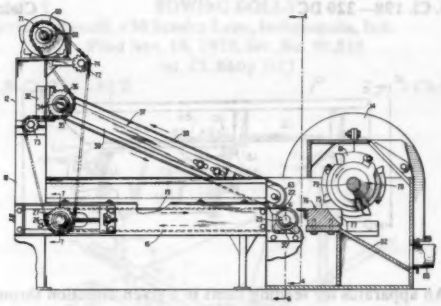
circular line of types in an operative position. Column selector means are connected by bevel gears with the typehead and rotate it about the first axis to place a selected column and type in an operative position confronting a platen.

3,703,231

MATERIAL FEEDING APPARATUS

William T. S. Montgomery, Jr., Jacksonville, Fla., assignor to Montgomery Industries International, Inc., Jacksonville, Fla.

Filed Nov. 23, 1970, Ser. No. 91,714
Int. Cl. B65g 15/14
U.S. Cl. 198—165 8 Claims



Apparatus for conveying and feeding pieces of wood or bulky items such as paper and cardboard boxes or the like to a cutting and punching type reduction device comprises a generally horizontal lower wide belt unit and a plurality of narrow upper belt units converging inwardly from a feed opening into that device. The belts define respective upper and lower sides of a feed passage moving in the same direction at the same speed. The narrow upper belt units are freely rockable about a common axis and all rest at their inner ends on the end of the wide belt adjacent the cutting and punching device.

3,703,232

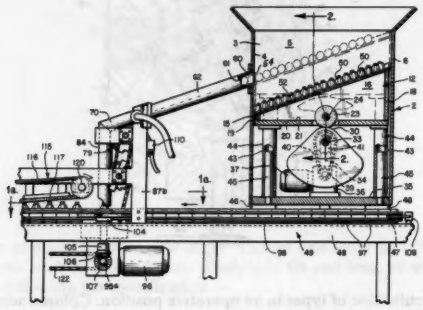
CONTAINER ORIENTING APPARATUS

Stanley J. Zbiegien, 5014 West Diversey Avenue, Chicago, Ill.

Filed Oct. 19, 1970, Ser. No. 81,650
Int. Cl. B65g 47/24
U.S. Cl. 198—33 AD 10 Claims

Apparatus for positioning containers upright from a disoriented pile in a hopper. A divider ramp with an inclined upper groove picks up a row of containers which orient with their major axes lengthwise of the groove. The containers slide

downwardly endwise into an orienting tube which provides a pair of inclined transversely displaced surfaces spaced less than the maximum width of the containers and between which each container tumbles over upside down in upright position with its center of gravity below the axis of rotation. Each con-



tainer as it tumbles once or slides down the spaced surfaces enters a pocket in a metering wheel extending between the surfaces. The wheel deposits each container in upright position into a vertical tube to a second metering wheel which deposits the container into a holder indexed therebeneath by a conveyor.

3,703,233

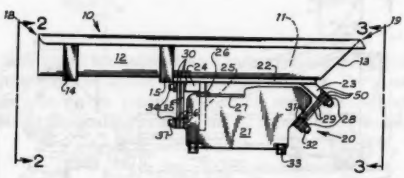
VIBRATORY FEEDING APPARATUS

Harold R. Hacker, 522 Woodview Drive, Noblesville, Ind.

Filed Feb. 8, 1971, Ser. No. 113,578

Int. Cl. B65g *27/24*

U.S. Cl. 198—220 DC **7 Claims**



An apparatus for feeding items in a given direction through the use of controlled vibratory motion. An open ended chute is mounted above a base in spaced relation. An armature fixed to the chute extends into the base and is vibrated by an electromagnet mounted within the base. The chute is mounted above the base by a first and second stack of leaf springs. The first stack of leaf springs is arranged vertically so as to be perpendicular to the chute. The second stack is arranged obliquely with respect to the first stack of leaf springs. A cover plate is mounted to the base enclosing the electromagnet and a rubber grommet mounted to the base is in sealing relationship with the armature. Rubber feet are mounted beneath and to the base.

3,703,234

DISPLAY PACKAGES FOR DRILLS, BITS AND SIMILAR BORING TOOLS, PROVIDING MEANS TO TEST IF PROPER SIZE FOR A GIVEN BOLT, SCREW OR DOWEL

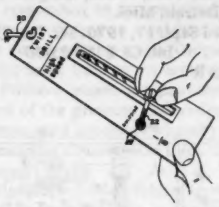
Joel A. Howard, Cliffside, N.J., assignor to Howard Hardware Products Inc., Bloomfield, N.J.

Filed July 27, 2970, Ser. No. 58,360

Int. Cl. B65d *73/00*; G01b *3/36*

U.S. Cl. 206—78 B **2 Claims**

A drill bubble-packaged on a card having a punched hole exactly the size the tool will bore. The card has a coating in the form of a flat ring around the hole; such ring being of a con-



trasting color and may be printed or constitute an adhered hole-reinforcement washer.

3,703,235

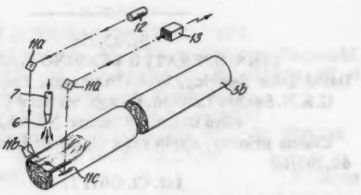
CIGARETTE TESTING APPARATUS

John McEnery, London, England, assignor to Molins Machine Company Limited, London, England

Filed Dec. 8, 1970, Ser. No. 96,188

Int. Cl. B07c *3/10*

U.S. Cl. 209—79 **14 Claims**



Apparatus for testing the tobacco ends of cigarettes comprises means for compressing the cigarette ends sideways by means of compressed air. The degree of compression produced by the air may be monitored for example by using a light beam which can pass by the cigarette end only when the end is soft, or by using a fluidics device for detecting the extent to which the cigarette end restricts the out-flow of air.

3,703,236

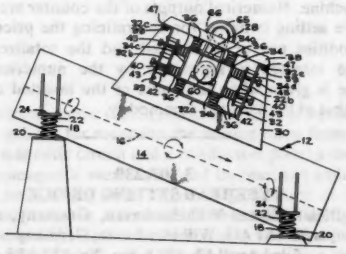
VIBRATOR MOUNTING

William V. Spurlin, and Patrick J. Carroll, both of Indiana, Pa., assignors to FMC Corporation, San Jose, Calif.

Filed July 31, 1970, Ser. No. 59,975

Int. Cl. B07b *1/34*

U.S. Cl. 209—326 **16 Claims**



A mounting for a rotary vibrator exciter for a two mass vibratory system wherein the rotary vibrator is mounted within a rectangular tubular frame which is connected to the structure to be vibrated by means of elastomeric blocks positioned on both of the horizontal and the vertical sides of the

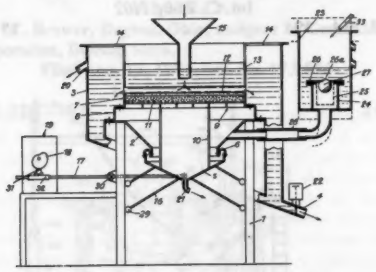
frame. By variation of the number, sizes, placement or compression of the elastomeric blocks the transmitted vibratory force component in the vertical and horizontal directions can be independently adjusted in order to obtain the desired vibratory motion in the vibrated structure and the desired natural frequency of vibration of the vibratory system.

3,703,237

DIFFERENTIAL-EFFECT BACKING VAT FOR COARSE AND FINE PARTICLES

Richard Cohen-Alloro, Orleans; Roger Cuvillier, Nanterre, and Jean Grassaud, Orleans, all of France, assignors to Bureau De Recherches Geologiques Et Minieres, Paris, France

Filed Jan. 7, 1971, Ser. No. 104,617
Claims priority, application France, Jan. 7, 1970, 7000396
Int. Cl. B03b *3/22*
U.S. Cl. 209—426 **6 Claims**



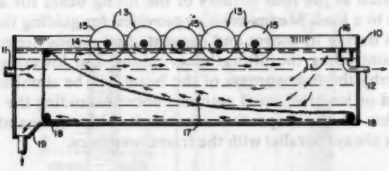
A method and apparatus for gravimetrically separating particles of different sizes and densities. A conical, liquid filled vat is closed at its smaller bottom opening by a rigid, flexibly mounted diaphragm and at its larger top opening by a flexibly mounted filter bed having a permeable bottom. The diaphragm and bed are rigidly connected and reciprocably driven along a vertical axis. The differential liquid flow promotes the migration of denser particles through the bed and into the vat.

3,703,238

APPARATUS FOR THE BIOLOGICAL TREATMENT OF WASTEWATER

Wilbur N. Torpey, 4923 Hanford Street, Douglaston, N.Y.

Division of Ser. No. 781,452, Dec. 5, 1968, Pat. No. 3,575,849.
This application March 1, 1971, Ser. No. 122,618
Int. Cl. C02c *1/10*
U.S. Cl. 210—151 **30 Claims**



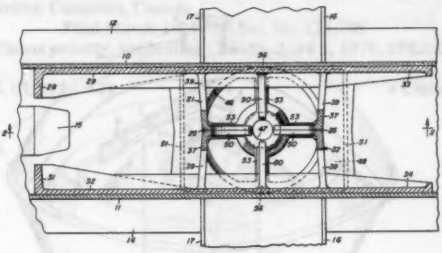
Method and apparatus for substantially upgrading the operating efficiency of wastewater treatment plants is disclosed. The invention utilizes forcibly rotating bodies that are partially submerged in the wastewater to provide surface area on which biological slimes develop and serve the purpose of removing pollutants from the wastewater. The rotating, partially submerged bodies are located in the upper portion of the treatment tanks, and, in addition to providing oxygen and nutrients for the growth and maintenance of biological slimes, serve to pump the wastewater to bring it in contact with the slimes.

3,703,239

CENTER BRACE FILTER AND CENTER PLATE ASSEMBLY

Loree Elwyn Furniss, Casa Grande, Ariz., assignor to The Buckeye Steel Castings Company, Columbus, Ohio

Filed Dec. 15, 1970, Ser. No. 98,243
Int. Cl. B61f *1/14, 5/16;* B61g *7/10*
U.S. Cl. 213—57 **5 Claims**



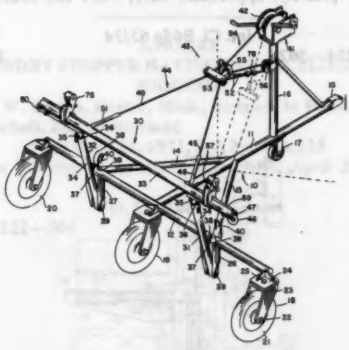
A center brace for mounting within the center sill of a railway car in the area of the underframe over the center plate and where the body bolster intersects the center sill and to provide an improved mounting of the center plate on the center brace.

3,703,240

TOWING DOLLY

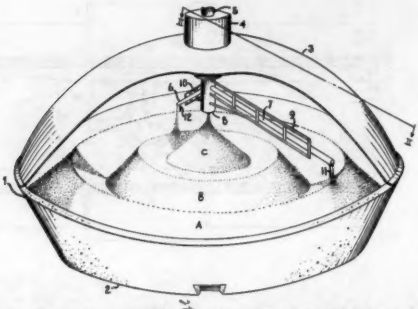
Arvin E. Russell, 430 Sandra Lane, Indianapolis, Ind.

Filed Nov. 18, 1970, Ser. No. 90,516
Int. Cl. B60p *3/12*
U.S. Cl. 214—86 A **9 Claims**



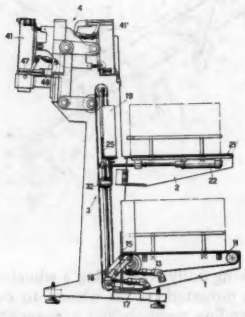
A vehicle towing dolly comprising a wheeled chassis carrying a subframe mounted on the chassis to swing between a rearwardly extending position and a generally upright position, the subframe being provided with a pair of transversely-adjustable brackets adapted to engage, and be secured to, a part of a vehicle to be towed, a winch on the chassis, and a cable arrangement wound on the winch and operatively connected to the distal region of the subframe to swing the subframe to upright position after engagement with the vehicle part, the cable arrangement being directly connectable to a part of the vehicle to be towed.

3,703,241
METHOD OF STORING PARTICULATE MATTER
Clifford J. Kelly; Regina Kelly, both of Saskatchewan, Canada, and Bernard J. Hukee, Jr., Muscatine, Iowa, assignors to Kalium Chemicals Limited, Saskatchewan, Canada
Continuation of Ser. No. 28,337, April 14, 1970, abandoned. This application Nov. 18, 1971, Ser. No. 200,038
Int. Cl. B65g *65/32*
U.S. Cl. 214—152 12 Claims



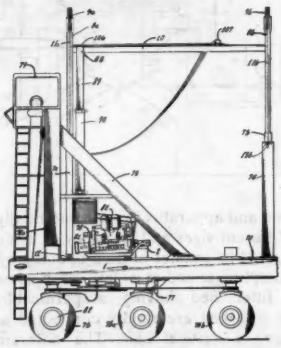
A method of storing particulate matter having a small particle size range, i.e. 2.5 to 325 mesh and which is susceptible to fracturing and breakage during handling is described. The material is stored in circular warehouses in a plurality of circumferential piles. Each circle of piled material has a different circumference and the vertical drop of the material from its entry into the warehouse to its resting place in the warehouse is minimized to avoid breakage. Uses of the method to store CK1, KaC1, $CaC1_2$ and mixed fertilizers are specifically disclosed.

3,703,242
AUTOMATIC TRAY-LOADING DEVICE FOR CIGARETTE PACKAGING MACHINES
Renato Marradi, Via del Lavaro 17, 40127 Bologna, Italy
Filed Oct. 21, 1970, Ser. No. 82,694
Claims priority, application Italy, Nov. 13, 1969, 24361 A/69
Int. Cl. B65g *65/34*
U.S. Cl. 214—302 8 Claims



A device for automatically feeding cigarette-trays into the hopper of a cigarette packaging machine within a remarkably reduced time, having the magazine of full trays located just above the floor level and under the magazine of empty trays so as to have a direct linkage between the tray-loading device and the tray-filling machine. This tray-loading device includes on a transfer mechanism at least one pair of tiltable tray containers which operate simultaneously in order to transfer full trays over the hopper of the packaging machine and empty trays from the hopper to a lifting mechanism. The same lifting mechanism, in addition to conveying the empty trays to the proper magazine, also conveys the full trays from the magazine to the transfer mechanism. A number of pneumatic cylinders are also provided for imparting movement to the various parts of the device, these pneumatic cylinders being actuated by sensing means such as limit switches and photocells.

3,703,243
STRADDLE CARRIER
John Thomas Monk, 405 Meadow Moss Drive, Jackson, Miss.
Filed Sept. 15, 1970, Ser. No. 72,444
Int. Cl. B60p *1/02*
U.S. Cl. 214—394 17 Claims

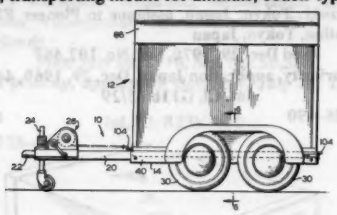


The straddle carrier has two spaced parallel elongated frame members adapted to straddle a load. A vertically disposed arch member connects the frame members together adjacent one end thereof and diagonally disposed leg members connect the tops of the arch to substantially the midpoints of the frame members. Ground wheels are flexibly mounted on the undersides of the frame members, and means for steering the wheels are provided. A rectangular load lifting beam is disposed between the frame members and arches. Means are provided engaging the four corners of the lifting beam for raising and lowering the lifting beam, means being provided at the four corners of the lifting beam for securing same to a load. Means are also provided for guiding the lifting beam during its ascent and descent. And means are provided for controlling the lifting beam raising and lowering means whereby the four corners of the beam will be simultaneously raised or lowered equal amounts notwithstanding the relative weights on the respective corners, in order to maintain the beam always parallel with the frame members.

3,703,244
TRAILER CHASSIS
David P. Walsh, and Joanne M. Walsh, both of 1400 Ramsey Drive, Edgewater, Md.
Filed Oct. 31, 1969, Ser. No. 873,001
Int. Cl. B60p *1/64*
U.S. Cl. 214—517 11 Claims

A multiple functional land trailer is provided which is adapted to receive, center and immovably hold material-

receiving containers such as, shipping containers for bulk material, transporting means for animals, coach-type living or



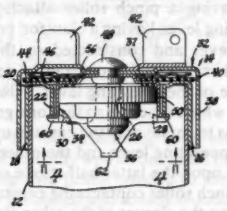
camping structures, or a plurality of material-receiving modular units and the like.

3,703,245

FILLER CAP

Robert W. Brewer, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 19, 1971, Ser. No. 173,086
Int. Cl. B65d *41/06*
U.S. Cl. 220—40 R **2 Claims**



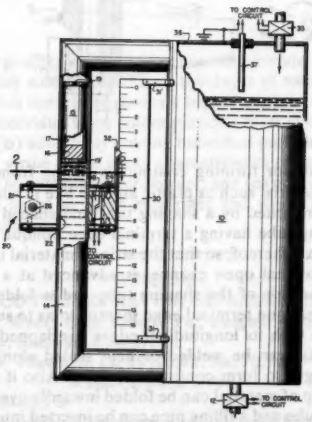
A filler cap for a motor vehicle fuel tank includes pairs of axially spaced locking and retaining tabs which successively engage the filler neck cam. When the first pair of tabs are disengaged, the second pair engage the cam to prevent direct removal of the cap and permit gradual pressure release from the tank. When the second pair of tabs are disengaged, the cap is completely removable from the filler neck.

3,703,246

LIQUID LEVEL CONTROL

John Horak, 470 Ottawa Avenue, Apt. 13C, Hasbrouck Heights, N.J.

Filed March 19, 1970, Ser. No. 20,895
Int. Cl. B07d *5/30*
U.S. Cl. 222—17 **3 Claims**



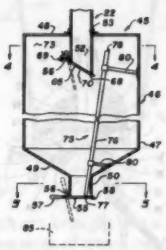
A liquid level sensing switching device comprising a magnetic float contained in a vertical channel and a magnetic reed switch positionable at calibrated levels adjacent the channel and means to dispense liquid from an associated container in quantities measured by the operation of said switch when the magnetic float drops from a predetermined level to the position of the switch.

3,703,247

GRAIN DISPENSING APPARATUS

Nykola Kostur, 1026 Brunette Avenue, New Westminster, British Columbia, Canada

Filed March 10, 1971, Ser. No. 122,705
Claims priority, application Canada, April 2, 1970, 078,932
Int. Cl. G01f *11/28*
U.S. Cl. 222—442 **4 Claims**



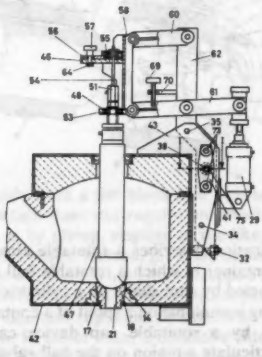
A tank connected at one end to a pipe through which granular material is delivered into the tank and into which a stream of air is drawn counter to the flow of material. The tank has a spout at the opposite end fitted with a manually controlled gate valve. A flap valve is fitted to the end of the delivery pipe within the tank. A by-pass tube extends from the spout to the upper end of the tank and the inlet end of the tube is sealed off by the gate valve in closed position. When a body of material impinges on the flap valve, this normally partially open valve is forced further open to allow the material to drop into the tank. When the gate valve is opened to empty the material from the tank, air pressure reaches the upper end of the tank through the by-pass tube and the flap valve automatically is closed to prevent some of the material from being entrained in the counterflowing air stream.

3,703,248

FOUNDRY STOPPER HAVING PARALLELOGRAM RIGGING

William W. Seaton, Dexter, Mich., assignor to Patusa Aktiengesellschaft, Zug, Switzerland

Filed April 21, 1971, Ser. No. 136,115
Claims priority, application Switzerland, April 27, 1970, 6248/70
Int. Cl. B22d *37/00*
U.S. Cl. 222—504 **5 Claims**



Disclosed is a guide mechanism for a stopper in a casting stopper container which allows axial alignment of the stopper

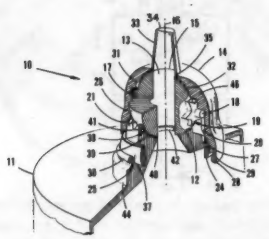
with respect to the nozzle in any direction. The guiding member is in the form of a parallelogram the vertical swivel column of which is pivotally supported on flexible strips. The stopper is suspended on a flexible rod arranged in spherical bearings to allow a fine axial adjustment of the stopper.

3,703,249

ROTATABLE OPENING CONTAINER CLOSURE

Edward Benjamin Middleton, 245 Forrest Hill Drive, Kitchener, Ontario, Canada

Filed May 8, 1970, Ser. No. 35,673
Int. Cl. B67d *3/00*
U.S. Cl. 222—507 4 Claims



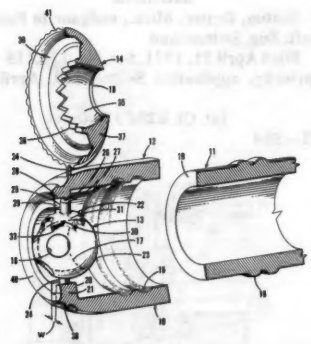
The disclosure sets forth a container closure device utilizing a rotatable spherical valve element having a through bore supported on an orificed base and enclosed by an orificed cap which is rotated on the base and including rack and pinion means active between base and cap to actuate the valve element between open and closed positions of the bore thereof relative to the orifice of the cap.

3,703,250

CLOSURE HAVING GEARED ROTATABLE BALL VALVE

Edward B. Middleton, 245 Forrest Hill Drive, Kitchener, Ontario, Canada

Filed April 12, 1971, Ser. No. 133,180
Int. Cl. B67d *3/00*
U.S. Cl. 222—507 9 Claims



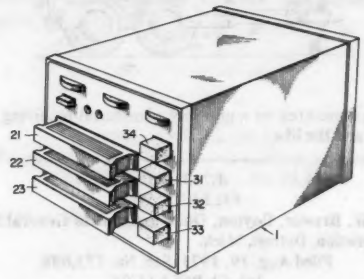
The specification describes a rotatable closure device for use with a container in which a rotatable ball type valve element is supported by stud shafts on a cylindrical barrel body, the latter being mountable on a spout of a container and being curroundable by a rotatable cap device carrying a rack adapted to articulate a pinion on the ball valve when turned. The valve member being adapted to deliver measured portions of container contents if desired.

3,703,251

MAGNETIC TAPE MAGAZINE PLAYING DEVICE

Michio Suzuki, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 29, 1970, Ser. No. 102,467
Claims priority, application Japan, Dec. 29, 1969, 44/2089
Int. Cl. G11b *15/29*
U.S. Cl. 226—90 6 Claims



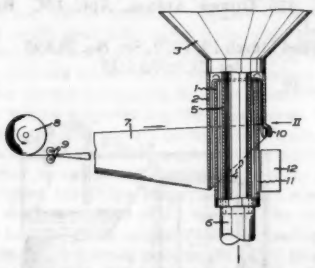
A magnetic tape magazine playing device which has a rotatable lever having a pinch roller attached to one end thereof, an operating lever having a claw for pressing one end of the rotatable lever and constructed so that the interval between the pinch roller and a capstan is substantially the same as the stroke of the operating lever. Also, electric contacts are provided which function so that one group of electric contacts close so as to rotate only the capstan upon the former half stroke of the operating lever and the other group of electric contacts close upon the latter half stroke of the operating lever so that the pinch roller contacts the capstan substantially simultaneously upon the closure of the other electric contacts.

3,703,252

METHOD OF AND APPARATUS FOR PRODUCING A TUBING FROM A STRIP OF MATERIAL

Jonnie Thor-Leif Silvandersson, Knared, Sweden, assignor to AB Akerlund & Rausing, Lund, Sweden

Filed May 18, 1970, Ser. No. 38,058
Claims priority, application Sweden, May 28, 1969, 7471/69
Int. Cl. B23k *1/20*
U.S. Cl. 228—15 6 Claims



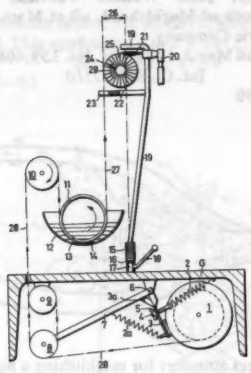
Apparatus for forming continuous tubing from a strip of web-like material such as plastic and the like in which a guide tube is surrounded by a shaping tube and spaced therefrom, said shaping tube having a terminal edge oblique to the longitudinal axis thereof, so that the strip of material in the shape of a longitudinal open channel is advanced at a substantial angle to the axis of the shaping tube and is folded inwardly about the oblique terminal edge thereof so as to surround the guide tube with its longitudinal edges overlapped. The web-like material can be welded or heat sealed along the overlapping edges to form continuous tubing. Also if desired the shaped strip of material can be folded inwardly over the end of the guide tube and a filling pipe can be inserted into the tubing for admitting substances into the tubing so that packages can be formed as the continuous tubing is advanced.

3,703,253

HEAT EXCHANGER

Franciscus Roffelsen, Helmond, Netherlands, assignor to Naamloze Venootschap Spiro Research N.V., Helmond, Netherlands

Filed July 20, 1970, Ser. No. 56,366
Claims priority, application Germany, July 23, 1969, P 19 37 350.3
Int. Cl. B23k 1/20
U.S. Cl. 228—17 5 Claims



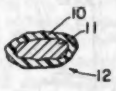
In apparatus for manufacturing heat exchanger having a pipe, a wire coil helically wound onto said pipe and a reinforcing edge capping wire firmly bonded to the edge of said wire helix. The pipe is rotated and axially moved by the apparatus and the capping wire is paid out by a storage drum by the action of a winding drum which dips the wire into soldering material and feeds it through a wire guide onto the wire helix.

3,703,254

PRE-FLUXED SOLDER POWDER

Theodore Maierson, Dayton; Harry L. Roe, Jr., Centerville, and James E. Williams, Kettering, all of Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed May 7, 1970, Ser. No. 35,414
Int. Cl. B23k 3/06, 35/14
U.S. Cl. 228—56 6 Claims



A solder powder is disclosed comprising minute particles of metallic alloy solder coated by a thin layer of rosin soldering flux such that the flux performs a triple function of: (a) insulating the individual alloy solder particles from electrical conductance; (b) adhesively holding individual particles of solder in place by virtue of the sticky characteristics of the preferred fluxes used to coat the solder powder; and (c) providing, when melted, an agent to clean substrates and workpieces to be joined by soldering.

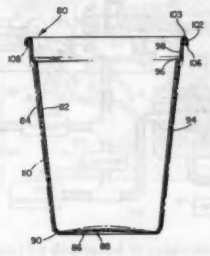
3,703,255

PLASTIC CONTAINER HAVING EXPANDED SIDE WALL

Gordon E. Wade, Glen Riddle, Pa., assignor to Scott Paper Company, Delaware County, Pa.

Filed Feb. 12, 1970, Ser. No. 10,742
Int. Cl. B65d 3/00
U.S. Cl. 229—1.5 B 2 Claims

A foamed, cellular thermoplastic container has a sidewall, at least a substantial portion of which is thicker and less dense than a bottom wall and lip region between which said sidewall is disposed. In a first embodiment of the invention the inner and outer surfaces defining the sidewall are uninterrupted, smooth surfaces, and in a second embodiment of the invention the inner surface of the sidewall is smooth and the outer surface is provided with alternate ridges and valleys. A process for thermoforming foamed, cellular thermoplastic containers from sheet material in which the sheet is positioned between



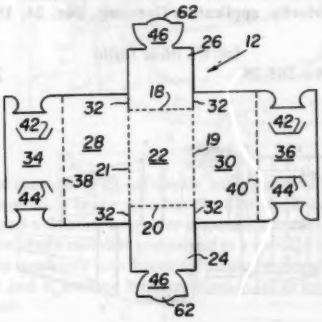
mold members which are brought into a final forming position to define a cavity, portions of which conform to the configuration of the container to be formed, and a reduced pressure is applied to opposite sides of the sheet within the sidewall region of the mold to permit entrapped gases in the cellular structure of the sheet to expand to thereby increase the thickness and lower the density of the sidewall of the container.

3,703,256

FOLDING BOX

Donald R. Ross, 126 California Avenue, Freeport, N.Y.

Filed March 23, 1971, Ser. No. 127,273
Int. Cl. B65d 5/10
U.S. Cl. 229—39 R 4 Claims



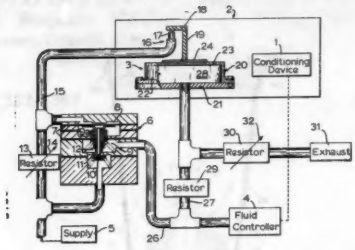
A box, foldable from a flat blank into a three-dimensional construction, which does not require an attachment of confronting walls, as by gluing, stapling or the like, as is characteristic of seamed boxes. Instead, the body of the box includes overlapping top walls which are either wrapped about erect or standing side walls and held in place by cooperating locking means on the side and top walls or otherwise held in overlapping relation. In either case, a definitive interior space or compartment is defined by the body having said overlapping walls.

3,703,257

CONDITION CONTROL SYSTEM AND INTEGRATED SENSOR AND FEEDBACK CHAMBER UNIT THEREFOR

Paul E. Thoma, Burlington, Wis., assignor to Johnson Service Company, Milwaukee, Wis.

Filed March 31, 1970, Ser. No. 24,307
Int. Cl. G05d *23/185*
U.S. Cl. 236—44 **7 Claims**



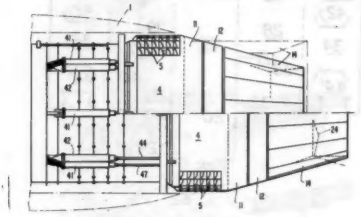
An environmental system includes a condition-sensing unit for sensing humidity or temperature. The unit includes a closed feedback chamber having an outer flexible flat wall. A material responsive to the selected environmental condition to be controlled is attached to the flexible flat wall in spaced relation to the periphery of the flat wall and defines a flexible sensor wall with a controlled deflection in response to condition changes. The flexible sensor wall is also connected to a lid overlying a control port of a pneumatic relay to adjust the control air supplied to a fluid controller for operating of a conditioning device. The control air is also connected via a resistor or the like directly to the feedback chamber to provide a related feedback signal which repositions the flexible sensor wall to establish feedback and stabilize the control loop. A variable resistor is connected to exhaust the feedback signal for adjustment of the degree of feedback pressure.

3,703,258

THRUST REVERSER UNIT

Walter Wildner, Munich, Germany, assignor to Motoren-und Turbinen-Union Munchen Gmbh, Munich, Germany

Filed Dec. 23, 1970, Ser. No. 100,889
Claims priority, application Germany, Dec. 24, 1969, P 19 64 976.4
Int. Cl. B64c *15/06*
U.S. Cl. 239—265.29 **25 Claims**



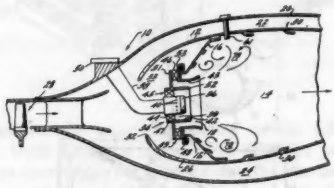
A thrust reversing device shutting-off the gas flow supplied by a turbojet engine and directing it to cascade vane assemblies extended from an engine fairing. An axially movable cylinder is provided with a variable thrust nozzle on its downstream end with recesses containing the reversing cascade vane assemblies. For an increased exhaust area, one or several tapering sections of a nozzle actuating skirt located downstream and generally following the engine fairing contour can be moved into recesses of nozzle flaps pivotable about transverse axes. For the reversing position, the cylinder with the reversing cascade vane assemblies is extended from the engine fairing over the end of the afterburner jet pipe, with the horizontal gas flow path by shut-off simultaneously by flaps of the variable thrust nozzle, which flaps are pivotable about transverse axes and form the divergent inner section of the thrust nozzle when the reversing device is in forward thrust position.

3,703,259

AIR BLAST FUEL ATOMIZER

Geoffrey John Sturgess, Swampscott; Jacob Sherman Hoffman, Peabody; John William Vdoviak, and Robert Hirschkron, both of Marblehead, all of Mass., assignors to General Electric Company

Filed May 3, 1971, Ser. No. 139,408
Int. Cl. B05b *7/10*
U.S. Cl. 239—400 **16 Claims**



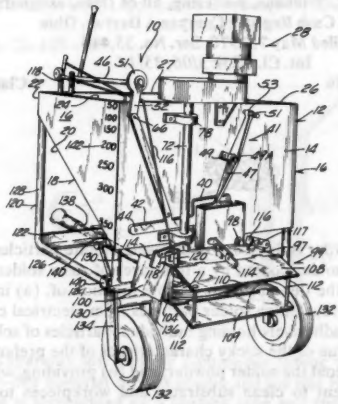
An air blast fuel atomizer for establishing a highly atomized fuel dispersion at the confluence of two counter-rotating air swirls, wherein a uniform concentration of fuel is disposed on a circumferential shroud and directed to the atomization forces at the lip of the shroud.

3,703,260

MATERIAL SPREADER

John P. Grabske, 2120 East Norwich, St. Francis, Wis.

Filed Dec. 4, 1970, Ser. No. 95,131
Int. Cl. A01c *17/00*
U.S. Cl. 239—666 **5 Claims**



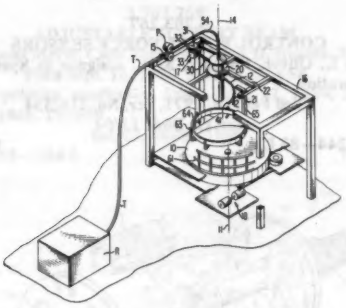
A compact versatile material spreader for use with salt or other materials has a spinner, which is partially enclosed by a spinner housing and which is located below a hopper discharge outlet and above the bottom of the spreader frame to thus afford convenient mounting of the spreader on the flat bed of a truck, a railroad push car, or a pallet carried by a fork-lift truck. An accessory trailer permits the spreader to be trailed behind a vehicle. Adjustable spinner blades afford various selected horizontal discharge angles. A remotely controlled deflector assembly is hinged to the spinner housing and

includes independently adjustable side and rear deflector plates to provide safe control of the discharged material to avoid contact with other vehicles or pedestrians. A metering gate at the hopper discharge outlet provides a variable discharge rate and economy in operation.

3,703,261
ORBITAL COILER

Daniel B. Cofer, Carrollton, Ga., and Thomas L. Bray, Birmingham, Ala., assignors to Southwire Company, Carrollton, Ga.

Continuation of Ser. No. 809,875, March 24, 1969, abandoned. This application April 7, 1971, Ser. No. 132,235
Int. Cl. B21c *47/14*
U.S. Cl. 242—82 **8 Claims**



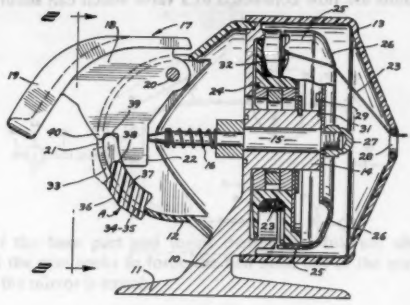
A coiler for coiling metal rod and similar strand material to form a coil and which includes a turntable rotatable about its center and a flyer tube rotatable above the turntable about an axis of rotation displaced from the axis of rotation of the turntable. The receiving end of the flyer tube is positioned in its axis of rotation and the flyer tube curves to terminate at a discharge end which moves in a circular path about its axis of rotation and which is oriented so that metal rod being discharged from the discharge end of the flyer tube is in a continuous series of loops having their centers substantially coinciding with the axis of rotation of the flyer tube. Metal rod to be coiled is fed into the receiving end of the flyer tube and as the metal rod is discharged from the discharge end of the flyer tube as a continuous series of loops, the loops drop to the surface of the turntable. The rotation of the turntable places the loops in succession on the turntable with their centers in a circular path having the axis of rotation of the turntable as its center, and the relationship between the diameter of the loops and the distance by which the axis of rotation of the flyer tube is displaced from the axis of rotation of the turntable is such that each loop includes within its circumference the axis of rotation of the turntable which becomes the centerline of the coil formed by the loops.

3,703,262
PUSH BUTTON LOCK FOR FISHING REELS

Eugene P. Menne, Mankato, Minn., assignor to Johnson Diversified, Inc., Mankato, Minn.

Filed July 16, 1970, Ser. No. 55,452
Int. Cl. A01k *89/00*
U.S. Cl. 242—84.2 A **7 Claims**

A fishing reel in which a thumb actuated lever is operative between line holding and line releasing positions, which incorporates a slidable locking button that yieldably engages the lever to restrain it in line holding position, to prevent accidental movement of the lever into line releasing position, but

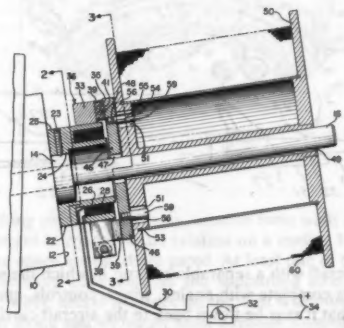


which button may be displaced in response to manual pressure on the lever in excess of such imposed restraint, to permit full control of the line by the lever.

3,703,263
CORD TENSIONING DEVICE

Edward E. Hunter, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed April 26, 1971, Ser. No. 137,304
Int. Cl. B65h *49/00*
U.S. Cl. 242—129.8 **21 Claims**



A cord tensioning let-off device having a spindle inclined to the horizontal, a brake member fixed at the lower end of the spindle and a floating armature disposed about the spindle adjacent the brake member and keyed to a spool of cord. Gravity draws the armature into frictional engagement with the brake member and is assisted by an electro-magnet associated with the device.

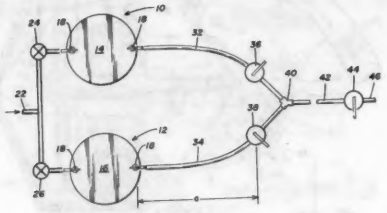
3,703,264
DISPENSING OF FIBROUS MATERIAL

James Buchanan Winn, Jr., Wimberley, Tex., assignor to The Aichilithic Company, Dallas, Tex.

Filed June 30, 1971, Ser. No. 158,283
Int. Cl. B65h *49/00*
U.S. Cl. 242—129 **10 Claims**

An improvement in a system for dispensing fibrous material with random distribution for reinforcing a matrix into which it is placed. The system includes a fiber supply apparatus for continuously feeding fiber to a dispensing gun with little or no down time. The apparatus includes two fiber supply con-

tainers, each connected to a source of compressed air. A lead conduit of sufficient length to insure entrainment of fiber by compressed air is in communication with each of the containers and leads to a dispensing conduit. Each of the lead conduits are flow connected to a valve which can simultaneously terminate air flow and cut a fiber being propelled therein, thus stopping fiber feed. The respective containers and lead conduits are used alternatively so that a fiber supply in one container can be replenished while the other container is supplying fiber to the dispensing system, thus eliminating any down time for fiber supply replenishment.

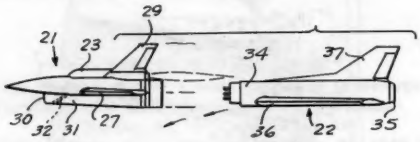


3,703,265

AIRCRAFT WITH SEPARABLE COCKPIT

Manuel Lopez Troitino, Ave. Julio Arjona 40-41, Chitre, Panama

Filed Oct. 30, 1970, Ser. No. 85,405
Int. Cl. B64c *1/00*
U.S. Cl. 244—13 **11 Claims**



An aircraft with a separable cockpit in which the separated cockpit is complete with engine, wings, controls, and landing gear so that it may be flown back to the aircraft carrier or airfield after the major portion of the plane has been damaged sufficient to be inoperative. Apparatus for detachably securing the two portions of the plane together are controlled by the pilot to separate the two portions when the main portion of the plane is damaged. Separable control elements for linking the cockpit controls to the control surfaces of the main portion of the airplane are also provided.

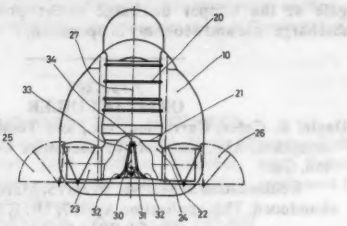
3,703,266

CONTROL UNIT FOR THE LIFT ENGINES OF VERTICAL AND SHORT TAKEOFF AIRCRAFT

Hans Lincks, and Erich W. Weigmann, both of Munich, Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed May 18, 1970, Ser. No. 38,062
Claims priority, application Germany, June 4, 1969, P 19 28 503.1
Int. Cl. B64b *1/36*
U.S. Cl. 244—52 **3 Claims**

Control unit for the lift engines of vertical or short takeoff aircraft for correction of motion preferably in relation to the roll axis. The lift engine discharges into a branched conduit of which each respective branch discharges to opposite external sides of the aircraft fuselage Infinitely adjustable means are provided for selecting and proportioning as desired the respective amounts of the engine discharge introduced into and conducted through said respective branches.

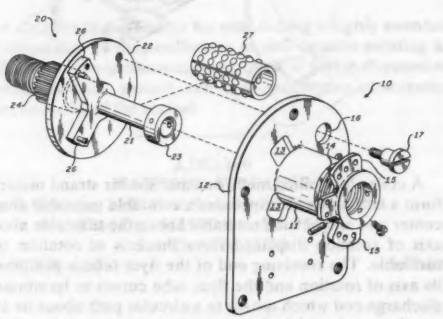


3,703,267

CONTROL WHEEL FORCE SENSORS

Kenneth L. Oliver, Phoenix, Ariz., assignor to Sperry Rand Corporation

Filed Feb. 18, 1971, Ser. No. 116,334
Int. Cl. B64c *13/04*
U.S. Cl. 244—83 E **10 Claims**



A mechanism disposed within the hub of an aircraft control wheel including pitch and roll flexure devices which act as the primary restraints to loads applied to the control wheel and a plurality of load beams that function as redundant sensors which react to a minimal percentage of the applied load. Bearing surfaces between the pitch and roll flexure devices effectively isolate the pitch flexures and beams from the load flexures and beams thereby eliminating cross-coupling between these devices in reacting to pilot initiated pitch and roll commands. Transducers affixed to the pitch and roll beams transform mechanical displacements produced in the beams into electrical output command signals which are used to control the aircraft attitude.

3,703,268

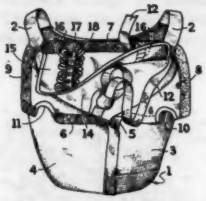
PARACHUTE CONTAINER AND THE APPLICATION OF THE CONTAINER TO A PARACHUTE

Marcel Pravaz, Clichy, France, assignor to Etudes et Fabrications Aeronautiques, Paris, France

Filed Dec. 16, 1970, Ser. No. 98,805
Claims priority, application France, March 27, 1970, 7011238
Int. Cl. B64d *17/50, 17/60*
U.S. Cl. 244—148 **6 Claims**

Automatically opened parachute container for a parachute having an automatic opening strap. The container has two lateral closing flaps whose longitudinal edge portions overlap and have intergripping properties for maintaining the container closed. A panel carrying the opening strap in the coiled

condition is disposed in the upper part of the container in such position as to be covered and protected by the flaps in the



closed container. The hooking end of the opening strap extends out of the closed container by way of an aperture in the container.

3,703,269

ADJUSTABLE SUPPORT BEAM

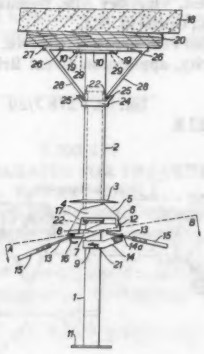
Miquel Casas Meriz, Calle Zaragoza, 11-4 D, Huesca, Spain

Filed Sept. 16, 1970, Ser. No. 72,654

Claims priority, application Spain, Sept. 17, 1969, 151849; Sept. 17, 1969, 151850

Int. Cl. E04g *25/08*

U.S. Cl. 248—354 L **7 Claims**



A support beam consisting of two telescopically interfitting tubular rods provided with an adjusting and locking device wherein the outer rod carries a support collar with opposite lateral extensions and the inner rod carries two sleeves, the upper sleeve being inclined and having opposite horizontal extensions engaged on their outer end by the lateral extensions of the support collar to exert a pressure on this sleeve causing pivoting movement therein to bear against the inner rod in a locking manner, the second sleeve having conventional means to lock it in position on the inner rod.

3,703,270

MOUNTING MEANS

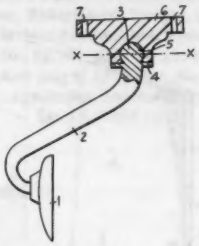
Robert Derrick Tomlin, Hampton Hill, England, assignor to Magnatex Limited, Hounslow, Middlesex, England

Continuation-in-part of Ser. No. 729,210, May 15, 1968. This application Oct. 20, 1970, Ser. No. 82,373

Int. Cl. B60r *1/04*

U.S. Cl. 248—475 A **7 Claims**

The invention relates to a construction of vehicle rearview mirror which conforms with the Federal Safety Regulations concerning interior mirrors, namely, that the mirror mounting shall break away or deflect or collapse when struck by a force of 90 lbs. The mounting comprises a ball head on the mirror arm which fits within a complementary socket of a resilient plastics material, such as "Delrin", forming the base part of the mounting. The arm also carries a shoulder which abuts the



top of the base part and forms therewith a fulcrum about which the arm rocks to force the ball head out of the socket when the mirror is struck.

3,703,271

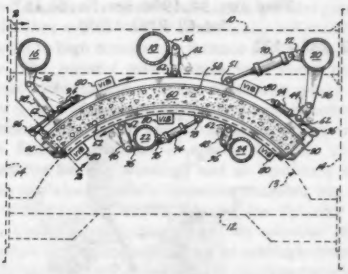
CONCRETE CASTING APPARATUS

Roy A. Kamb, 660 South Dakota Street, Seattle, Wash., and Tyman H. Fikse, 1459 Loraine Street, Enumclaw, Wash.

Filed Dec. 31, 1970, Ser. No. 103,040

Int. Cl. E04g *11/06*

U.S. Cl. 249—34 **10 Claims**



A matching pair of, preferably, arcuate form walls are supported upright in spaced-apart relation on a casting bed. The ends of the space enclosed are gated. At least one of the form walls is pivotally connected to the supporting structure by links that, when lateral pressure on the wall is applied, cause the wall to swing and withdraw from a freshly formed casting between the form walls. At the same time, raising of the form walls is initiated, to, in part, strip them from the casting and, eventually to raise them high enough that they may be moved over and past the just formed casting to a new location on the casting bed.

3,703,272

X-RAY FILM CASSETTE WITH IDENTIFICATION EXPOSURE WINDOW AND EXPOSURE INDICATOR

Norman N. Lareau, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

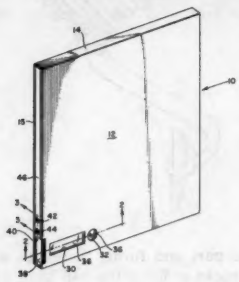
Continuation of Ser. No. 765,948, Oct. 8, 1968, abandoned. This application Nov. 12, 1970, Ser. No. 89,100

Int. Cl. G03b *17/26*

U.S. Cl. 250—67 **4 Claims**

A film cassette includes a rigid base having a cylindrical film supporting surface and a resiliently curved cover which closes over the cylindrical surface in mating relationship therewith to enclose the film and define flat, rectangular external cassette surfaces. The cassette is provided with an exposure window through which the film can be exposed to patient identifica-

tion information by photographic projection and a color-coded indicator to give a visual signal when the film has been



patient identified. An observation opening may also be provided for positive inspection to ensure the presence of film in the cassette.

3,703,273

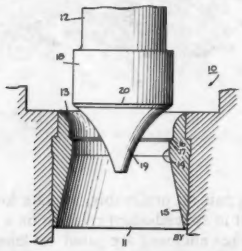
LOW LOSS INNERVALVE ASSEMBLY

Henry Illing, Parksville, N.Y., assignor to Kieley & Mueller, Inc., Middletown, N.Y.

Filed Aug. 24, 1970, Ser. No. 66,167

Int. Cl. F16k *47/00*

U.S. Cl. 251—122 **11 Claims**



The seat ring is formed with a bellmouth inlet while the innervalve can be tapered, flat or curved. The bellmouth shaped inlet allows a high flow rate to be obtained with energy losses and noise reduced to a minimum. The inlet can be slightly modified to change the valve characteristic without effecting efficiency to any significant degree.

3,703,274

AGGREGATE DRYER FOR ASPHALT PLANT

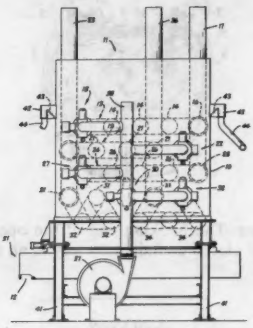
David E. Davis, Indianapolis, Ind., assignor to Midwest Steel Fabricators, Inc., Indianapolis, Ind.

Filed Dec. 28, 1970, Ser. No. 101,793

Int. Cl. F27b *1/08*

U.S. Cl. 263—30 **3 Claims**

Disclosed is a dryer-heater for drying and heating aggregate material prior to its mixing with other ingredients in the production of asphalt paving materials. Drying of the aggregate is accomplished as it moves vertically through an open bin, heat being provided by sinuous passes of tubes carrying hot combustion gases from fuel burners to exhaust stacks; the combustion gases are kept separate from the aggregate so that



no dust or fines are discharge from the stack and the sinuous combustion gas tubes are placed so as to efficiently utilize the heat from the burners to dry and elevate the temperature of the aggregate.

3,703,275

TREATMENT OF CEMENT RAW MATERIALS

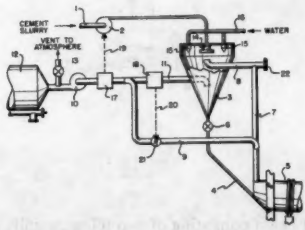
Karl Jens Sylvest, Vigerslev Alle, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Feb. 17, 1971, Ser. No. 115,951

Claims priority, application Great Britain, Feb. 26, 1970, 9,421/70

Int. Cl. F27b *7/20*

U.S. Cl. 263—32 R **10 Claims**



In the processing of cement raw materials a slurry of those materials which includes alkalis is preheated and dried by hot gases from a kiln. These gases which are cooled by the drying process subsequently flow to a dust precipitator. An amount of hot gases from the kiln is allowed to by-pass the slurry and flow to the dust precipitator so as to bring the temperature of the gases entering the dust precipitator into the range of 125° to 250°C. Simultaneously, there is a reduction of the amount of alkali material carried into the kiln by the dried slurry.

3,703,276

CORRUGATED INNER COVER STRUCTURE

Joseph R. Ford, Lakewood, Ohio, assignor to Lee Wilson Engineering Company Inc., Cleveland, Ohio

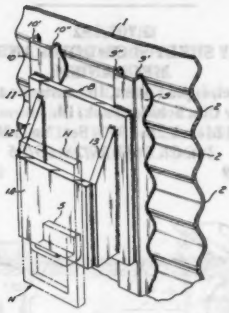
Filed Aug. 16, 1971, Ser. No. 171,992

Int. Cl. F27d *1/18*

U.S. Cl. 263—49 **3 Claims**

An inner cover structure particularly adapted for use in annealing coils of strip steel or the like in a bell type furnace in which the inner cover comprises a transversely corrugated cylindrical body of relatively thin sheet metal having a closed top and an open bottom. The cylindrical body has secured to the outer surface thereof two or more circumferentially

spaced lifting lugs or brackets which are adapted to receive lifting hooks so that the inner cover may be positioned on and removed from a furnace charge by means of an overhead crane or the like. The lifting brackets each comprise a plurality of spaced vertical members of approximately the same



gauge metal as the cylindrical body and having their edge portions corrugated to conform to the corrugations of the cylindrical body and welded thereto. Crane hook socket forming members are secured to the vertical members and are adapted to be engaged by the lifting hooks referred to above.

3,703,277

COOLING APPARATUS FOR THE OUTLET OF A ROTARY KILN

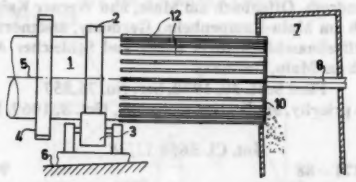
Ulrich Walter Bosshard, Winterthur, Switzerland, assignor to "Holderbank" Management & Consulting Ltd., Kanton Aargau, Switzerland

Filed Feb. 2, 1971, Ser. No. 111,930

Claims priority, application Switzerland, Feb. 4, 1970, 1559/70

Int. Cl. F27d *9/00*; F28d *15/00*

U.S. Cl. 263—44 **8 Claims**



Cooling means for the outlet of a rotary kiln are disclosed. The cooling means comprises a plurality of closed boiler tubes containing a vaporizable liquid and its vapor. The tubes encircle the outlet end of this kiln and extend in the direction of the kiln's axis of rotation and are generally parallel with one another. The end portions of the tubes nearest the kiln outlet are connected in a thermally conductive manner with the cylindrical shell of the kiln. The remainder of the tubes are in the ambient atmosphere in which the kiln is operated. The means preferably includes an annular portion which extends radially inward from the ends of the tubes and adjacent to the end face of the kiln outlet to protect the face from heat radiating from the kiln. The annular member is preferably segmented and is made of a thermally conductive material.

3,703,278

FURNACE FOR SINTERING POWDER

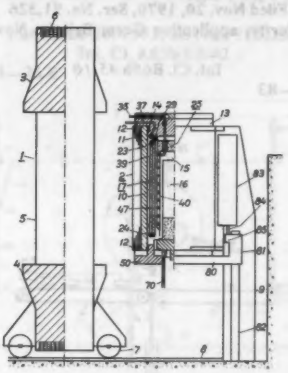
Sven-Erik Isaksson, Robertsfors, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Division of Ser. No. 12,701, Feb. 19, 1970, abandoned. This application July 9, 1971, Ser. No. 161,200

Claims priority, application Sweden, March 3, 1969, 2856/69

Int. Cl. C21d *1/00*

U.S. Cl. 266—24 **4 Claims**



Sintered bodies are formed from powder material by sintering a body produced from a powder at atmospheric pressure or below and at such a temperature that the powder grains adhere to each other and thereafter isostatically hot pressing the sintered bodies to high density in a furnace containing an inert atmosphere. The powder may contain hard metal particles such as metal carbides and a binder of an iron group metal. The furnace is formed by a cylindrical pressure chamber with a high pressure cylinder and end closures projecting into the cylinder. A furnace chamber is arranged in the pressure chamber and has heating windings and an insulating lid and bottom. One end closure of the pressure chamber has an annular part with members sealing against the cylinder and a valve plate covering the opening of the annular part. A vacuum conduit is provided which can be sealingly connected to the annular part and which includes projecting members for separating the valve plate and the annular part when the conduit is placed in operative position.

3,703,279

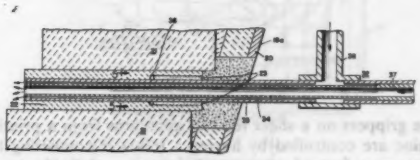
REACTOR

Joseph M. Saccomano, and John D. Ellis, Jr., both of Fort Wayne, Ind., assignors to Joslyn Manufacture and Supply Co., Chicago, Ill.

Filed Aug. 15, 1969, Ser. No. 850,358

Int. Cl. C21b *7/16*

U.S. Cl. 266—41 **1 Claim**



There is provided an improved reactor for the refining of molten metals, including an improved reaction vessel generally circular in cross section for holding a charge of molten metal, and having a lower side wall portion of the container sloping inwardly. A cover is provided on the container having edge areas projecting abruptly inwardly and having an elongated pouring spout radially inwardly of the edge areas.

The reaction vessel is provided with an improved tuyere formed generally of concentric tubes of constant cross section so that the cross section of the tuyere remains constant as the tuyere erodes away with the erosion of the inner lining during successive heats of refined metal.

3,703,280

LAUNDRY STACKING MACHINE

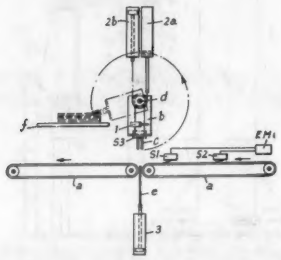
Henry John Weir, 37, Ormerod Road, Chepstow, England

Filed Nov. 20, 1970, Ser. No. 91,326

Claims priority, application Great Britain, Nov. 22, 1969, 57,260/69

Int. Cl. B65h *45/18*

U.S. Cl. 270—83 **9 Claims**



A machine for folding and stacking laundry articles comprising a clamp having a pair of substantially horizontal elongate jaws; tucking means for tucking a laundry article between the jaws to allow the article to be clamped at a fold line; and driving means for swinging the clamp about and over a substantially horizontal axis so that the body of the clamped article is flung outwardly down on to a stack where the article is released from the jaws.

3,703,281

SHEET FEEDING APPARATUS HAVING GRIPPER CONTROL, FOR USE WITH PRINTING MACHINES

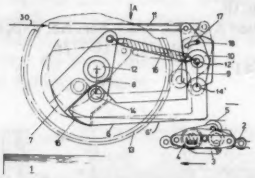
Oskar Liebert, Westheim, and Klaus Theilacker, Neusass, both of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg AG, Augsburg, Germany

Filed Aug. 12, 1971, Ser. No. 171,167

Claims priority, application Germany, Aug. 17, 1970, P 20 40 670.6

Int. Cl. B65h *29/28*

U.S. Cl. 271—79 **12 Claims**



The grippers on a sheet feeding apparatus from a printing machine are controlled by having a follower contacting the leading cam formed as a parallelogram - shiftable track, suspended on leading and trailing swing arms of equal length, having one end each pivotable about leading and trailing points, the shiftable track being arranged at shallow angle with respect to the center of the chain conveyer; and a trailing cam, formed as a swingable segmental-like element swinging about a pivot point and having a leading edge thereof located approximately in the prolongation of a line connecting the pivot point thereof and the suspension point of the trailing swing arm of the shiftable track. The trailing cam means being formed to have a leading edge outline which matches substantially with the trailing edge outline of the leading cam, so that the gripper control follower will be smoothly engaged by both leading and trailing cams to release sheets carried by the grippers, and the release position is readily adjustable for various sizes of printed material.

3,703,282

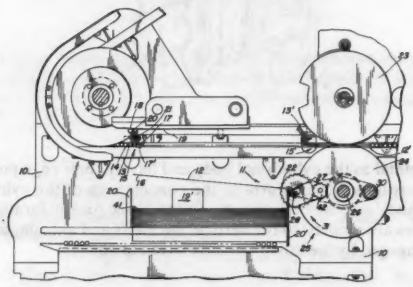
PLANETARY SHEET SLOWDOWN AND LAYDOWN MECHANISM

Allmen P. Henkel, Lake Forest, Ill., assignor to Western Printing Machinery Co., Schiller Park, Ill.

Filed March 26, 1971, Ser. No. 128,358

Int. Cl. B65h *29/28, 29/06*

U.S. Cl. 271—79 **5 Claims**



A sheet slowdown and stacking mechanism having horizontal grippers for engaging the tail edge of a sheet moving at high speed over a sheet stack followed by release of the leading edge of the sheet from a conveying transport gripper bar, the tail edge of said sheet being carried forward and downward on a curvilinear path engaged by the horizontal grippers which are gyrating about the axis of a rotating reel, said grippers decelerating the forward motion of the sheet substantially to zero at the point of release over the sheet stack for laying down the sheet on the stack pile.

3,703,283

DEVICE FOR SENSING AND CONTROLLING THE DELIVERY PILE OF SHEET-FED PRINTING PRESS

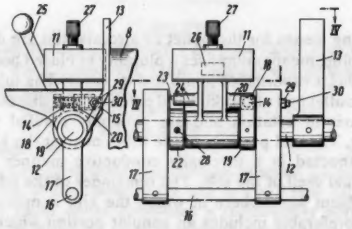
Paul Abendroth, Offenbach am Main, and Werner Kaiser, Offenbach am Main-Rumpenheim, Germany, assignors to Roland Offsetmaschinenfabrik Faber and Schleicher AG, Offenbach am Main, Germany

Filed Sept. 30, 1970, Ser. No. 76,857

Claims priority, application Germany, Oct. 8, 1969, P 19 50 650.4

Int. Cl. B65h *31/38*

U.S. Cl. 271—88 **9 Claims**



A device for sensing and controlling the height of a pile of sheets on the delivery table of a sheet-fed rotary printing press has a contactless sensing head loosely mounted on an oscillat-

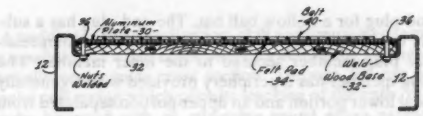
ing shaft which carries the joggers for aligning the delivered sheets. The sensing head is resiliently urged against stop means to maintain it in sensing position but can be swung clear of the pile with the joggers when the shaft is rotated to bring the joggers away from the pile to take a proof sheet by the interengagement of dogs on the sensing head and the shaft. Switch means in the head are provided to stop the pile table motor when the head is swung clear.

3,703,284

DIAGNOSTIC AND THERAPEUTIC EXERCISE TREADMILL

Joseph A. Hesen, Burbank, Calif., assignor to Del Mar Engineering Laboratories, Los Angeles, Calif.

Filed Dec. 31, 1970, Ser. No. 103,155
Int. Cl. A63b 23/06
U.S. Cl. 272—69 **6 Claims**



An improved exercise treadmill is provided for diagnostic and therapeutic purposes, and which includes a heavy multiply nylon belt which is driven along and around a metal plate to define the walking area. The metal plate is composed, for example, of material of high heat conductivity, and it is coated with Teflon. This results in low friction and insures low drag, regardless of the weight of the patient. An advantage of the Teflon coating is that it does not require waxing. The aforesaid plate may be coated on both sides so that it may be reversed for extended use after the Teflon coating on one surface has become worn.

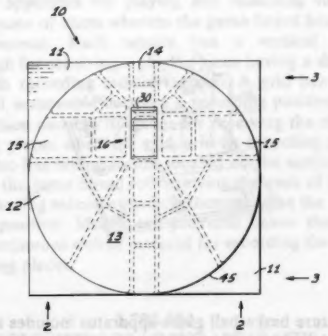
Additionally, the metal plate is supported by a layer of resilient sheet material mounted on a platform to give the desired resilience to the plate.

3,703,285

PITCHER'S MOUND WITH TOE BLOCK AND REINFORCING RIBS

James T. Perry, Knightstown, Ind., assignor to Philip H. Willkie, Rushville, Ind., a part interest

Filed April 29, 1971, Ser. No. 138,642
Int. Cl. A63b 71/00
U.S. Cl. 273—25 **5 Claims**



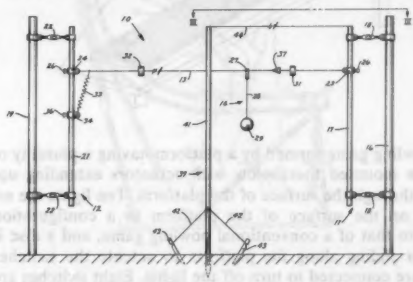
A portable pitching mound having a removable toe block and reinforcing ribs. A base is integrally joined to an upward sloping mound having a removable toe block secured at its top. The removable toe block is secured within the mound by a tongue and groove arrangement. The removable toe block is made from rubber having a heel supporting portion and a toe supporting portion. Various reinforcing ribs are integrally attached to the hollow bottom interior of the mound supporting the removable toe block. A non-skid pad is attached to the bottom of the pitcher's mound.

3,703,286

BATTING PRACTICE DEVICE

William C. Adkin, Route No. 2, Ganges Twsp., Allegan County, Mich.

Filed June 24, 1971, Ser. No. 156,236
Int. Cl. A63b 69/40
U.S. Cl. 273—26 E **10 Claims**



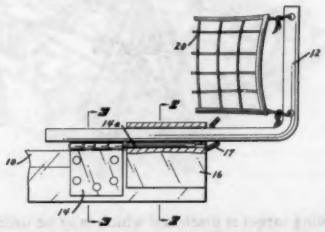
A batting practice device having an elongated line extending between a pair of upright pole assemblies. A ball is fixedly secured to one end of a short tether line, the other end of which is slidably connected to the guide line. The guide line has a fixed stopped secured adjacent each end thereof, which stop is spaced from the adjacent pole. A person stands near one pole assembly for throwing the ball to a batter standing adjacent the other pole assembly. A one-way stop device is fixedly secured to the guide line adjacent said one pole assembly and is slightly spaced from the adjacent fixed stop whereby the tethered ball assembly, when batted by a batter, will freely pass over said one-way stop so as to engage the adjacent fixed stop. The one-way stop prevents rebound of the ball toward the pitcher but keeps the ball positioned close to the pitcher to permit further throwing thereof. A safety post is preferably positioned in front of the pitcher for preventing the pitcher from being struck by the ball after same has been hit by the batter.

3,703,287

NET HOLDER FOR TABLE TENNIS TABLE

Max D. Smith, and Frank M. Adkins, both of Evansville, Ind., assignors to Indian Industries, Inc., Evansville, Ind.

Filed May 12, 1971, Ser. No. 142,441
Int. Cl. A63b 61/00
U.S. Cl. 273—30 **3 Claims**

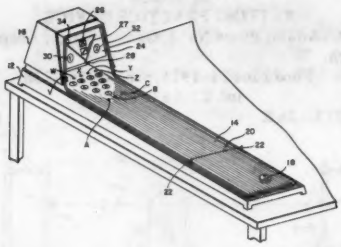


A net holder for a table tennis table defined by a slide which is received on an elongated hinge pin of a conventional hinge, where the net bracket, in turn, is received in the aforesaid slide. Catch means are provided for maintaining the position after net assembly.

3,703,288
ELECTRONIC BOWLING GAME

John D. Vogel, and William N. Canfield, both of Columbus, Ind., assignors to Arvin Industries, Inc., Columbus, Ind.

Filed Oct. 22, 1969, Ser. No. 868,344
Int. Cl. A63d 3/00
U.S. Cl. 273—41 9 Claims

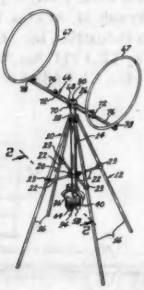


A bowling game formed by a platform having a plurality of switches mounted therebelow with actuators extending upwardly through the surface of the platform. Ten lights are arranged on the surface of the platform in a configuration similar to that of a conventional bowling game, and a disc is used for sliding along the platform to actuate the switches which are connected to turn off the lights. Eight switches are used and they control the ten lights by means of logic circuitry which interconnects the switches with the lights. The game also includes a second series of lights including a ready light, a "ball" light for indicating whether it is "ball one" or "ball two" which will be thrown, a strike light, and a spare light. Circuits for controlling these lights together with a reset circuit are interconnected with the switches, the logic circuitry and the pin lights so that the game is electronically controlled. Circuitry is included to prevent actuation of the logic circuitry when the platform is subject to physical shock and to prevent actuation of the switches when the disc is returned along the platform to a player.

3,703,289
REVOLVING TARGET HAVING HORIZONTALLY ALIGNED HOOPS

Terrel L. Hohman, 235 North Pleasant St., Prescott, Ariz.

Filed July 6, 1971, Ser. No. 159,844
Int. Cl. F41j 9/00
U.S. Cl. 273—55 R 9 Claims



A revolving target is disclosed which may be used for training or amusement purposes and is provided with a pair of hoops mounted on a rotating member. The hoops are spaced apart and driven at various speeds to develop or test the skill of a user by requiring not only accuracy of projection, but also requiring precise timing so that a projectile will pass through both hoops.

3,703,290
BALL BAT CONSTRUCTION

Richard C. Wilson, Arcadia, Calif., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed March 8, 1971, Ser. No. 121,677
Int. Cl. A63b 59/06
U.S. Cl. 273—72 A 7 Claims

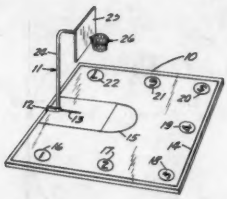
An end plug for a hollow ball bat. The end plug has a substantially rigid inner plug member and a resiliently compressible outer plug member secured to the inner member. The outer plug member has a periphery provided with a generally cylindrical lower portion and an upper portion separated from the lower portion by an outwardly open annular recess. The inner plug member has a generally radially outwardly directed stabilizer portion which extends radially outwardly at least to a position adjacent to the periphery of the outer plug member. The outwardly directed stabilizer portion of the inner plug member may be divided into a plurality of individual stabilizer segments and may be provided with underlying reinforcing members.

A hollow ball bat having a generally cylindrical barrel portion and a generally cylindrical handle portion. At least one of the barrel and handle portions terminating in an open end provided with a transversely inwardly directed flange which is engaged within the annular recess of the end plug to provide an effective mechanical joint between the bat and the end plug. The composite end plug serves to provide both sound and vibration deadening means and integral structural reinforcing means resisting relative axial movement between the end plug and the ball bat.

3,703,291
BASKETBALL APPARATUS INCLUDING A POST STABILIZING SLOT

Warren R. Lutz, 249 Grant Drive, Route 3, Stillwater, Minn.

Filed Sept. 22, 1971, Ser. No. 182,697
U.S. Cl. 273—85 R 3 Claims



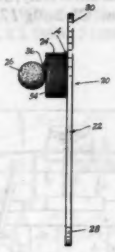
A miniature basketball game apparatus includes a flat base centrally slotted at one edge to receive a post supported on a thin foot for insertion beneath the slotted base and in turn supporting a backboard and basket. A narrow extension of the slot receives an edge of the backboard when the device is disassembled for storage in a close-fitting box. Several sequentially numbered circles on the flat base are provided to induce competitive play.

3,703,292

PADDLE WITH ELASTIC COIL BALL TETHER

Irving Starr, 8560 Averett, St. Louis, Mo.

Filed Aug. 26, 1970, Ser. No. 67,003
Int. Cl. A63b 73/02
U.S. Cl. 273—97 R 2 Claims



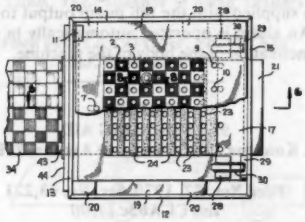
A paddle toy for coordination, skill and amusement employing a paddle and a ball connected by a coil spring having a substantially rectangular cross section. Through the use of the special coil spring which permits stacking of the coils, the ball can be bounced with an intriguing sound effect against the paddle requiring the development of skill for amusement. In modifications, the ball may be substituted by a figurine and the ball or figurine and the paddle can be coated with a luminescent paint for nighttime illumination.

3,703,293

GAME BOARD WITH RECORDING MEANS

Armas H. Nekton, 32 Sunset Road, Valley Stream, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,157
Int. Cl. A63f 3/02
U.S. Cl. 273—136 C 16 Claims



A game apparatus for playing and recording successive plays in a game of chess wherein the game board has squares marked thereon. Each square has a vertical opening therethrough for receiving a playing piece having a shank and an end with recording indicia thereon. A grid beneath the game board is movable between a recording position and an inking position and has openings for receiving the shanks of the playing pieces when the grid is in its recording position. The grid also has inking means located on the surface of the grid facing the game board for receiving the ends of the playing pieces having recording indicia thereon when the grid is in its inking position. Means are provided below the grid to supply a continuous web of material for recording the position of the playing pieces.

3,703,294

GOLF SWING TRAINING APPARATUS

Robert E. Fitch, R.R. 1, P.O. Box 39, Bloomington, Ind.

Filed Sept. 20, 1971, Ser. No. 181,694
Int. Cl. A63b 21/04, 69/36
U.S. Cl. 273—191 R 10 Claims

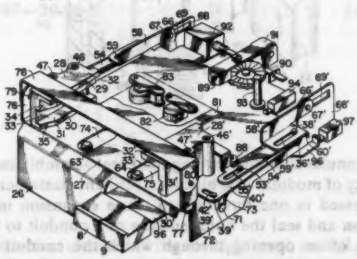
An apparatus for training and perfecting a golfer's swing. An arcuate shaped rod is mounted atop members which extend upwardly from a flat base. A handle configured in a manner similar to the top end of a golf club shaft is connected by means of a flexible cord to a ring which is slidably mounted to the rod. An elastic line is connected to the cord between the ring and handle and extends upwardly therefrom passing through a plurality of guiding pulleys with the opposite end of the line being secured to a connector adjustably mounted to one of the members. The connector is adjustably movable along the length of one of the members, so as to control the tension in the line. A golfer by standing on the base may grasp the handle which is normally urged at the top end of the rod by the elastic line. The golfer may then swing the handle downwardly along the path of the arcuate shaped rod which is configured and positioned in an empirical relationship with respect to the base.

3,703,295

MAGNETIC RECORDING AND REPRODUCING APPARATUS

Kozo Yamamoto, Hirakata-shi, and Takehisa Takamiya, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 2, 1969, Ser. No. 881,380
Claims priority, application Japan, Dec. 9, 1968, 43/91274; Dec. 9, 1968, 43/91275; Dec. 9, 1968, 43/91276; Dec. 9, 1968, 43/91277; Dec. 9, 1968, 43/91278; Dec. 9, 1968, 43/91279; Dec. 9, 1968, 43/91280; Dec. 9, 1968, 43/91281
Int. Cl. G11b 25/06
U.S. Cl. 274—4 G 5 Claims

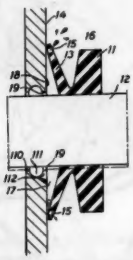


A magnetic recording and reproducing apparatus capable of recording and reproducing magnetic tapes accommodated in magnetic tape containers of different shapes, i.e., in both a tape cassette in which a tape is sent from one reel to another and an endless cartridge, which are selectively inserted into the apparatus.

3,703,296
SEALING BETWEEN A ROTARY AND A STATIONARY MEMBER

Sven Erik Malmstrom, Peftele, Sweden, assignor to Forsheda Gummifabrik AB, Forsheda, Sweden

Continuation of Ser. No. 709,841, March 1, 1968. This application May 20, 1970, Ser. No. 37,489
Int. Cl. F16j 15/16, 15/42
U.S. Cl. 277—25 3 Claims

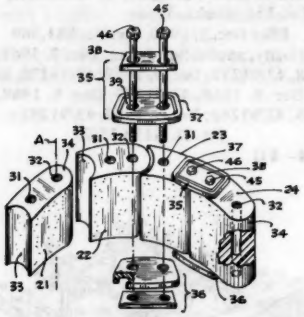


A sealing between a rotary and a stationary member comprises two substantially axially engaging slide rings, one of which is connected to the rotary member while the other is connected to the stationary member. The slide ring connected to the rotary member is provided with at least one passage interconnecting the spaces located on either side of the slide ring.

3,703,297
ARTICULATED LINK SEALS

Robert J. Gignac, Belleville, Mich., assignor to Thunderline Corporation, Wayne, Mich.

Filed Dec. 22, 1970, Ser. No. 100,634
Int. Cl. F16j 9/16, 15/02
U.S. Cl. 277—166 5 Claims

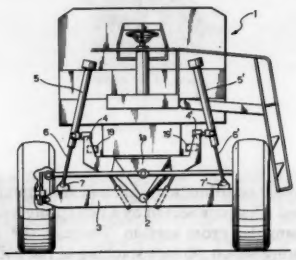


An annular shock-absorbing fluid seal assembly including a plurality of modular seal blocks of resilient elastomer material compressed in one direction to cause expansion in another direction and seal the outer surface of a conduit to the inner surface of an opening through which the conduit projects. Two pressure plates span the joint between each adjacent pair of seal blocks, on opposite sides of the blocks, and are joined by bolts that extend through the blocks, the bolts and pressure plates joining the blocks in a ring as well as compressing the seal blocks. One embodiment uses two bolts for each pair of pressure plates; another employs arcuate guide ribs on the pressure plates that fit into complementary grooves in the seal blocks.

3,703,298
DEVICE FOR AUTOMATIC SELF-LEVELLING OF THE BODY OF A THRESHING-HARVESTING MACHINE

Pietro Laverda, Breganze, Italy, assignor to Pietro Laverda S.p.A., Breganze, Italy

Filed June 11, 1971, Ser. No. 152,144
Claims priority, application Italy, July 6, 1970, 69323 A/70
Int. Cl. B60g 17/04
U.S. Cl. 280—6 H 3 Claims



Automatic self-levelling of the body of a threshing-harvesting machine is effected by a device which is sensitive to the operation of respective magnetic float switches located in respective interconnected liquid-containing vessels positioned on opposite lateral sides of the body. Each vessel contains two laterally spaced apart float switches connected to electrovalves in an hydraulic circuit for self-levelling actuators so that when either of the laterally outer float switches is operated the actuators are supplied with part of the hydraulic fluid output from a pump to effect correction and when either of the inner switches is operated at a greater angle of inclination, the actuators are supplied with the full pump output to effect rapid levelling. An alarm is operated automatically in the event of excessive inclination of the body of the machine.

3,703,299
SKI TEACHING AID

Edward K. Kutchma, 2003 Pinegrove Avenue, El Paso County, Colo.

Filed Nov. 27, 1970, Ser. No. 93,221
Int. Cl. A63c 11/00
U.S. Cl. 280—11.37 E 1 Claim

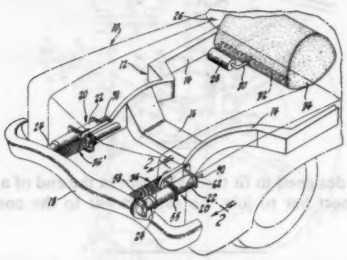
The invention resides in a device for securing the tip ends of a pair of skis together comprising a pair of clamps for attachment to the outside edges of the skis, which clamps are interconnected by a flexible strap or web.

3,703,300

VARIABLE CAPACITOR CRASH SENSOR

Arden G. Gillund, Oak Creek; Dan K. Holtshouse, Milwaukee; John A. Moretti, and Vincent A. Orlando, both of Greendale, all of Wis., assignors to General Motors Corporation, Detroit, Mich.

Filed July 2, 1971, Ser. No. 159,169
Int. Cl. B60r 21/08
U.S. Cl. 280—150 AB 7 Claims



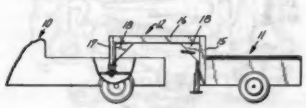
A pair of electro-mechanical sensors mounted between the vehicle bumper and frame exhibit a capacitance related to the position of the bumper relative to the frame. During a collision, the changing capacitance of the sensors is detected by control circuitry to determine the velocity of the bumper relative to the frame at impact. If the velocity at impact is greater than a predetermined value for a predictable interval of time, where the predictable interval of time varies with the velocity at impact, a signal is provided for inflating a cushion.

3,703,301

TRAILER HITCH

Dee Randle, Ennis, Tex., assignor to Swan Trailers Inc., Garland, Tex.

Filed Feb. 12, 1971, Ser. No. 114,836
Int. Cl. B62d 53/00
U.S. Cl. 280—438 4 Claims



An inverted generally U-shaped tongue affixed to the front end of a trailer with the forward downwardly directed end thereof having a downwardly directed opening therein and an upwardly projecting member affixed generally centrally in a truck body, which member is constructed to be received within the opening in the tongue, said tongue and member having transverse, aligned openings therethrough with a pin receivable therein. A jack is incorporated in the front end of the trailer to raise and lower the tongue to disengage and engage it with the member mounted in the truck box.

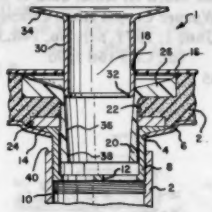
3,703,302

DRAIN ASSEMBLY FOR DRAIN PIPE

Henry William Demler, Sr., Lebanon, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed March 26, 1971, Ser. No. 128,296
Int. Cl. F16l 5/00
U.S. Cl. 285—161 1 Claim

According to the invention, a drain assembly adapts a drain pipe for operative connection to a basin. The drain pipe is provided with a compressible resilient liner which is at least partially received in the drain pipe. A substantially rigid sleeve is forcibly inserted into the liner compressing it radially outward against the encircling drain pipe. The sleeve is especially suited for forming the drain of the basin and the compressed



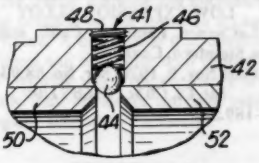
liner forms a sealed interface between the basin drain and the drain pipe, thereby operatively coupling the drain pipe to the basin.

3,703,303

SLIP-FIT ELECTRICAL COUPLING

Jonah Eidelberg, Huntington Station, N.Y., assignor to Electrical Fittings Corporation, East Farmingdale, N.Y.

Filed Aug. 24, 1970, Ser. No. 66,408
Int. Cl. F16l 21/06
U.S. Cl. 285—382.7 5 Claims



An electrical coupling for attachment to a pair of rigid conduits in a confined space includes a sleeve member which slidably receives the conduit, and further includes a stop member centrally disposed on the sleeve for movement into and out of the bore of the sleeve for providing a stop when extending into the bore, and for allowing the sleeve to be slipped back onto either conduit when the screw is removed from the bore of the sleeve.

3,703,304

CONSTRUCTION ELEMENT WITH ANCHOR TEETH

Walter J. Losee, Indianapolis, Ind., assignor to Atlas Engineering Products, Inc., Indianapolis, Ind.

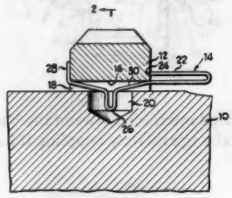
Continuation-in-part of Ser. No. 876,794, Nov. 14, 1969, abandoned. This application Sept. 9, 1971, Ser. No. 178,894
Int. Cl. F16b 5/00
U.S. Cl. 287—20.92 L 4 Claims

A construction element of the multiple tooth or nail type in which the long, narrow teeth are arranged in pairs, each tooth of each pair projecting in the same general direction substantially perpendicularly from a plate, being integral with the plate and being formed on one lateral edge only with a spur extending generally toward the mating tooth and with a relief region between the spur and the tooth base, the teeth being longitudinally dished in their facing surfaces and being twisted in a common direction so that the spurred edge of each tooth is advanced toward its mating tooth.

3,703,305
SPRING CLIP RETAINER

George L. Wise, and Mark A. Russ, both of Muncie, Ind., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed June 1, 1971, Ser. No. 148,373
Int. Cl. F16d *1/06*
U.S. Cl. 287—52.05 1 Claim



A spring clip formed with a stop means on one end, a bight to engage a shaft and a resilient end forming another stop means for detachably securing a hub to a shaft.

3,703,306
METHOD OF HERMETICALLY SEALING SILICON TO A LOW EXPANSION ALLOY

Murdock H. LaChance, Pasadena, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 9, 1970, Ser. No. 88,034
Int. Cl. C03c ; F16b *11/00*
U.S. Cl. 287—189.365 5 Claims

FASTENING MATING SURFACES OF BODY OF SILICON AND BODY OF LOW EXPANSION ALLOY
PREPARE FACILITATING MATING SURFACE OF BODY OF SILICON AND PREPLATING MATING SURFACE OF BODY OF LOW EXPANSION ALLOY
APPLYING SEALING ALLOY BETWEEN MATING SURFACES OF BODY OF SILICON AND BODY OF LOW EXPANSION ALLOY
HERMETICALLY SEALING TOGETHER BODY OF SILICON AND BODY OF LOW EXPANSION ALLOY BY FUSION OF SEALING ALLOY

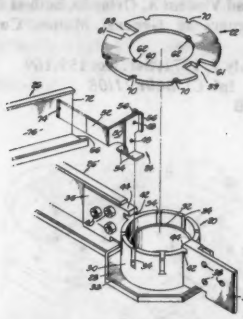
A surface of silicon is hermetically sealed to a surface of Kovar by coating the surface of silicon with several thin layers of silver, coating the surface of Kovar with a layer of copper, applying a tin-base sealing alloy between the two coated surfaces and then heating the tin-base sealing alloy so as to cause it to fuse to the two coated surfaces.

3,703,307
CONNECTOR STRUCTURE FOR SUSPENDED CEILINGS AND THE LIKE

Rolando T. Curtis, Los Angeles, Calif., assignor to Integrated Ceilings, Inc., Los Angeles, Calif.

Filed Oct. 16, 1970, Ser. No. 81,398
Int. Cl. F16b *7/04*
U.S. Cl. 287—189.36 R 8 Claims

A connector structure for joining a plurality of support bars (e. g., "T-bars") of a suspended ceiling or the like in a desired pattern. The connector structure comprises a generally cup-shaped connector member having an outer peripheral wall provided with a plurality of upwardly opening slots. Connecting clips, which are designed to engage and retain the support bars forming the grid structure of the suspended ceiling, are inserted into the slots in the peripheral wall. The clips are maintained in place by an inner peripheral wall spaced radially inwardly from the outer peripheral wall of the connector member, and by a cover member releasably secured over the upper edge of the outer wall. Each connecting clip is provided

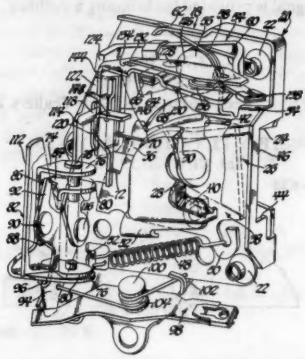


with a tab designed to fit through a slot in the end of a ceiling panel support bar to join the support bar to the connector member.

3,703,308
CLOSURE LATCH

Edward E. Campbell, Sterling Heights, and Bela Sandor, Detroit, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 16, 1970, Ser. No. 89,686
Int. Cl. E05c *3/26*
U.S. Cl. 292—216 5 Claims



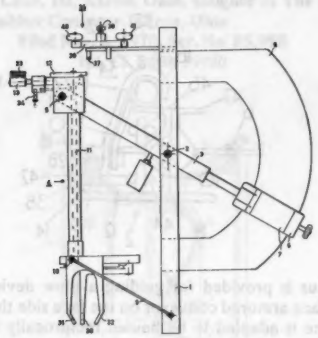
A closure latch includes a support frame on which is pivotally mounted an inverted fork bolt and a detent for maintaining the bolt in either of two latched positions. A generally Z-shaped operating lever is pivoted to a side flange of the frame at a juncture of the former. The other juncture of the operating lever is pivoted to one end of an elongated intermittent member for longitudinal translation thereof. The terminal legs of the operating lever are respectively engageable by an inside release lever and an outside release lever, the directions of engagement being opposite such that the release levers are alternately engageable with their respective legs. A lateral pin on the frame received within a slot on the intermittent member guides translatory movement of the intermittent member by the operating lever and independent swinging movement of the intermittent member relative to the operating lever between coupled and uncoupled positions with respect to the detent. A tab on the intermittent member is received within a slot of a locking lever which is supported on a cantilevered arm of the frame and movable between locked and unlocked positions. The locking lever in unlocked position locates the intermittent member in coupled position with respect to the detent, and in locked position locates the intermittent member in uncoupled position with respect to the detent.

3,703,309

AUTOMATICALLY DISCHARGING GRIPPER DEVICE

Jacob H. Mosterd, Stationsweg 117, Barneveld, Netherlands

Filed June 18, 1971, Ser. No. 154,477
Claims priority, application Netherlands, June 23, 1970, 7009235
Int. Cl. B25b 5/12
U.S. Cl. 294—86 R 5 Claims



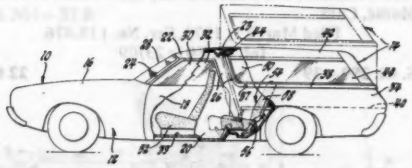
Gripper provided with an arm, which arm is resilient and can be closed by a spring, an axis provided with locking means being coupled with a pivotable arm, which via a resilient stretchable link is connected with a further pivotable arm and a rectilinear working spring device is acting upon one of the said pivotable arms.

3,703,310

DUAL CONFIGURATION VEHICLE BODY

Leonard A. Lystad, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 1, 1971, Ser. No. 148,777
Int. Cl. B60p 3/42
U.S. Cl. 296—10 4 Claims



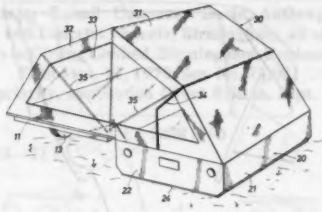
A primary vehicle body member having an open cargo compartment and a forward passenger cab with an open side adjoining the cargo compartment is adapted for conversion from the open configuration to a closed configuration by the installation of a removable secondary body member over the cargo compartment. A rear seat structure in the primary body member includes a seat back which is supported on the primary body member for pivotal movement between a retracted position wherein it cooperates with a seat base in comfortably supporting passengers and an extended position wherein it closes the lower portion of the open adjoining side of the cab. A partition is supported on the seat back for pivotal movement from a lowered position to a raised position above the seat back so that in the extended position of the seat back the latter cooperates with the partition in completely closing the adjoining side of the cab to thus insure the comfort of passengers in the cab when the secondary body member is removed.

3,703,311

TENT CAMPING TRAILER

Robert W. Davis, 4310 Goldfinch, Houston, Tex., and Karl L. Dahlstrom, 942 Ashwood, Lewisville, Tex., assignors to said Davis, by said Dahlstrom

Filed April 16, 1971, Ser. No. 134,582
Int. Cl. B60p 3/34
U.S. Cl. 296—23 R 10 Claims



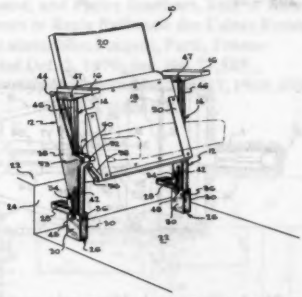
A tent camping trailer comprising a trailer frame mounted on a wheel and axle assembly and an enclosure having side and end walls and a top wall, pivotally attached along one side to one side of the frame, allowing the enclosure to be swung from a traveling position on the frame to a camping position along side the frame. A collapsible tent covering may be attached to the frame and enclosure with support members for erection of the covering when the enclosure is moved to the camping position. The enclosure top wall may be pivotally connected along one side of the enclosure.

3,703,312

COLLAPSIBLE ARM CHAIR

Howard D. Chapman, Highland Park, Ill., assignor to Clarin Corp., Chicago, Ill.

Filed Dec. 3, 1970, Ser. No. 94,807
Int. Cl. A47c 1/12
U.S. Cl. 297—35 2 Claims

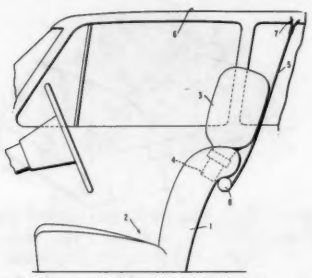


A chair is provided which is collapsible for pivotal movement about a generally horizontal axis between an erect position and a generally horizontally disposed position. The chair includes a selectively releasable latch for locking the chair in the erect position and means effective to prevent release of the latch and movement of the chair to the collapsed position when the chair is occupied.

3,703,313
SEAT, ESPECIALLY FOR MOTOR VEHICLES

Gerhard Schiesterl, Stuttgart, and Helmut Wulf, Nellingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Germany

Filed July 29, 1971, Ser. No. 167,217
Claims priority, application Germany, July 29, 1970, P 20 37 565.9
Int. Cl. A47c 7/36
U.S. Cl. 297—391 5 Claims

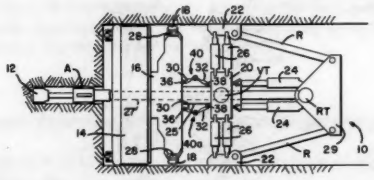


A seat, especially for motor vehicles, in which a gas cushion acting as headrest and automatically inflatable in case of an accident is arranged at the backrest of the seat; at least one belt is arranged behind the gas cushion for absorbing the rebound forces of the head of the passenger impinging against the gas cushion whereby the belt is arranged, on the one hand, within the area of the vehicle roof, and on the other, at the seat.

3,703,314
ROLL ATTITUDE CORRECTING MEANS, FOR TUNNELING MACHINES

William H. Hamilton, and Jack O. Winsor, both of Seattle, Wash., assignors to Lawrence Manufacturing Company, Seattle, Wash.

Filed Feb. 3, 1971, Ser. No. 112,259
Int. Cl. E01g 3/04
U.S. Cl. 299—31 18 Claims

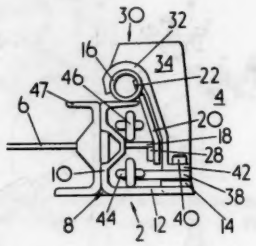


The method comprises holding only one of two relatively movable tunneling machine portions against movement and displacing the other portion about a tunneling machine boring axis, and then holding only the other portion and corresponding displacing the one portion. The means comprise linkage members mutually joined and in which each one thereof is individually coupled to one of the machine portions, and means operative for effecting relative movement between the members.

3,703,315
APPARATUS FOR PLOWING LOOSE PARTICULATE MATERIAL

John Henry Trolley, Sandbach, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Jan. 18, 1971, Ser. No. 107,251
Claims priority, application Great Britain, Jan. 20, 1970, 2,714/70
Int. Cl. E21c 27/32
U.S. Cl. 299—34 10 Claims

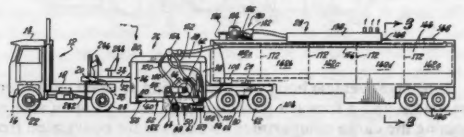


Apparatus is provided for guiding a plow device along a long wall face armored conveyor on the face side thereof. The plow device is adapted to be hauled reciprocally by a chain along the length of the conveyor or a portion thereof. The apparatus includes an L-shaped elongate member which has an upright limb and a lower limb. The upright limb is securable to a side of the conveyor and the lower limb constitutes the base of the apparatus. The upright limb has secured along its upper edge a tube for guiding the device and a substantially continuous horizontal chain guide member extending therefrom to define upper and lower chain races. A cover plate is provided and is releasably secured to the tube in sealing relationship therewith to prevent contamination of the races by loose material. The cover plate abuts the free end of the chain guide member but is spaced from the lower limb of the elongate member such that in use a part of the plow device can extend through the space to engage a chain in the lower race to be driven thereby.

3,703,316
PAVEMENT CUTTING MACHINE

Cecil W. Hatcher, and Gene Warner, both of P.O. Box 1263, El Monte, Calif.

Filed March 1, 1971, Ser. No. 119,476
Int. Cl. E01c 23/09
U.S. Cl. 299—39 22 Claims



A pavement cutting machine for cutting bumps or grooves. A tractor has a hitch with a cutter trailer and a tank trailer. The tank picks up the sludge from the cutter, filters it and recirculates the filtered water to the cutter. One or more hydraulic cylinders for the cutter or cutters act against a frame member which supports the tank whereby the weight of the tank snubs the cutter or cutters. The tractor has an alternative low speed drive from its engine. Alternative depth control is provided for the cutter for bump cutting or cutting grooves. The cutter is a single cutter or two cutters having overlapping shafts at their inner ends with the spacing between adjacent cutting disks the same as on each cutter for cutting grooves or

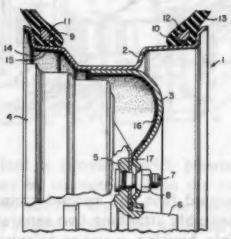
overlapped for cutting bumps. A floating beam carried by a frame supports one end or both ends of the cutter or cutters. The frame pivots on a horizontal axis on a header having a hitch with the tractor. Hydraulic cylinders act on the frame and on each floating beam to move them to active or idle position.

3,703,317

VEHICLE WHEEL AND BRAKE WITH HEAT SHIELD

Charles L. Laun, III, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 2, 1970, Ser. No. 85,998
Int. Cl. B60b *19/00*
U.S. Cl. 301—6 R 4 Claims



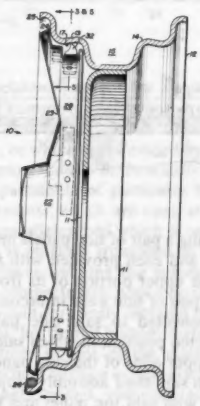
A heat shield coating on the surface of a wheel opposite form the tire bead seat surface and adjacent to the brake assembly to limit heat transmission into the wheel and then through the wheel into the bead of a tire mounted on the wheel. The heat shield coating can also be used on the outside surface of the brake housing to limit heat transmission into the housing. The heat shield coating can also be used on the outside surface of the brake assembly to limit heat transmission from the brake assembly.

3,703,318

RETAINING MEANS FOR WHEEL TRIM MEMBERS

Claude J. Marshall, Ann Arbor, Mich., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 763,224, Sept. 27, 1968, abandoned. This application Sept. 28, 1970, Ser. No. 76,291
Int. Cl. B60b *7/06*
U.S. Cl. 301—37 R 2 Claims



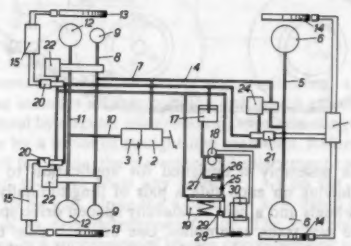
A wheel trim member including a cover portion having a circular outer margin, a substantially rigid annular ring extending axially from the outer margin, and a plurality of independent, angularly spaced-apart retaining members for resiliently retaining the trim member on a wheel, each of the individual retaining members including a base secured to the rigid ring, at least one flexible portion projecting outwardly from the base to engage the wheel, and a substantially rigid portion extending radially outwardly from the base for limiting the deflection of the flexible portions under shock load conditions.

3,703,319

HYDRAULIC SYSTEMS FOR VEHICLES

Brian Ingram, Balsall Common; David Anthony Harries, Solihull, and Lancelot Phoenix, Birmingham, all of England, assignors to Girling Limited, Birmingham, England

Filed Sept. 17, 1970, Ser. No. 73,081
Claims priority, application Great Britain, Sept. 17, 1969, 45,705/69
Int. Cl. B60t *8/06*
U.S. Cl. 303—21 F 20 Claims



In a vehicle hydraulic braking system fluid under pressure from a master cylinder is supplied to a wheel brake through a chamber of which the effective volume is variable between a minimum value and a maximum value by movement of a piston assembly working in a bore in communication with the chamber.

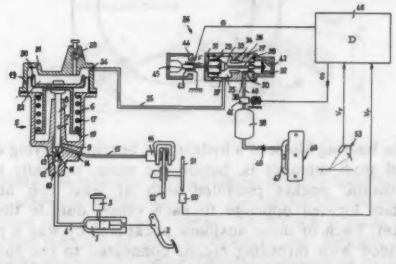
Means are included for normally subjecting the piston assembly to a supply of pressure fluid to urge the piston assembly into a first position in which the effective volume of the chamber is at the minimum value. A control valve is operative in response to a control signal to cause movement of the piston assembly in a second opposite direction to increase the effective volume of the chamber whereby the pressure of hydraulic fluid applied to the wheel brake is reduced.

3,703,320

BRAKING SYSTEM CONTROL AND ANTI-LOCK DEVICES

Jacques C. Remaud, and Pierre Bouthors, both of Billancourt, France, assignors to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, France

Filed Oct. 2, 1970, Ser. No. 77,589
Claims priority, application France, Oct. 17, 1969, 6935756
Int. Cl. B60t *8/06*
U.S. Cl. 303—21 F 5 Claims



This anti-lock device for the wheels of motor vehicles comprises a detector adapted to transmit a signal proportional to

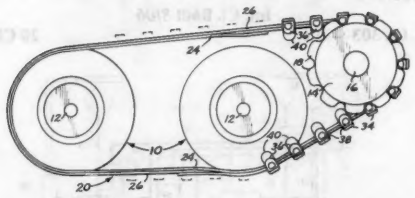
the slip of a wheel, a member for modulating said signal which is interposed between a source of vacuum and an expansion unit of the braking circuit. Said detector is adapted to compare two signals of which the magnitudes are proportional to the momentary speed of the wheel and to the real speed of the vehicle in relation to the ground, respectively, so as to energize said modulating member.

3,703,321

TRACK ASSEMBLY FOR TRACKED VEHICLES

Richard H. A. Schoonover, West Linn, Oreg., assignor to Formac International, Inc., Seattle, Wash.

Filed July 31, 1970, Ser. No. 59,930
Int. Cl. B62d 55/24
U.S. Cl. 305—38 3 Claims



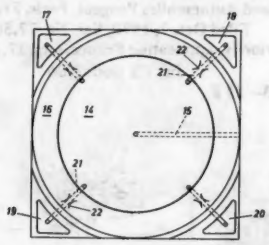
A track assembly is designed for application to tracked vehicles having on each side a pair of longitudinally spaced support wheels and a pair of laterally spaced drive sprockets. There are two track assemblies, one on each side. Each assembly includes a pair of laterally spaced endless belts mountable about the wheels and sprockets. A plurality of grousers are fastened in longitudinally spaced relation transversely to the belts. A plurality of wheel guides are fastened to the inner surfaces of the grousers between the belts. The grousers and guides may be cast an integral units, simplifying the structural arrangement and improving its performance.

3,703,322

HYDROSTATIC BEARING

Anders Christer Gustafsson, Nymanegatan, Sweden, assignor to SKF Industrial Trading and Development Company, NV Amsterdam, Netherlands

Filed Sept. 22, 1971, Ser. No. 182,804
Claims priority, application Sweden, Sept. 23, 1970, 12909/70
Int. Cl. F16c 17/02
U.S. Cl. 308—122 3 Claims



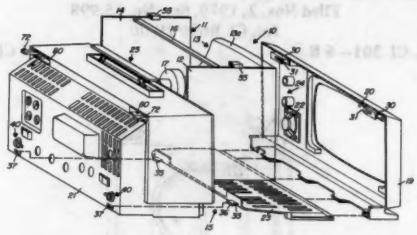
The bearing block of a hydrostatic bearing carrying a cylindrical shaft member is, beside the main, centrally located hydrostatic pocket provided with at least two auxiliary pockets located opposite to each other, outside the main pocket. Each of these auxiliary pockets is by way a passage provided with throttling means connected to the source of fluid supply, and an adjustment of the pressure within the auxiliary pockets is automatically obtained if the bearing is subjected to an obliquely directed load.

3,703,323

QUICK-RELEASE CONNECTOR ASSEMBLY FOR MULTIPLE MEMBER TELEVISION CABINET

John D. Gallas, Roselle, and Richard J. Hofmeister, Arlington Heights, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed July 28, 1971, Ser. No. 166,795
Int. Cl. A47b 81/06; F16b 12/00; H47b 47/00
U.S. Cl. 312—7 TV 9 Claims



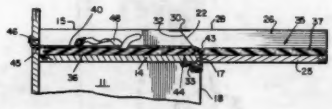
Interiorly mounted first and second connector means are provided for releasably attaching two separate housing members of a multiple housing member television cabinet. The second connector means is in the form of an elongated member having bi-directional movable opposite end portions and being slidably connected to one of the housing members through the provision of an arcuate groove extending both traversely and longitudinally with respect to the elongated member and a guide means captured within the groove for movement therealong. Exteriorly accessible motion transmitting means are connected to an end portion of the elongated member and are effective to impart movement to said elongated member in one direction along the groove for connecting the first and second connector means and in an opposite direction along the groove for releasing the first and second connector means.

3,703,324

CHEST

Lee E. Smith, c/o Smith Cabinet Manufacturing Co., Inc., Salem, Ind.

Filed Jan. 13, 1971, Ser. No. 106,166
Int. Cl. A47b 81/00
U.S. Cl. 312—279 6 Claims

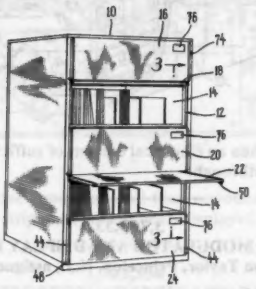


A cabinet having a pair of side panels interconnected by top and rear panels and each provided with a rearwardly angled portion along the upper portion of its front edge. A shelf assembly having a pair of side walls interconnected by a top wall is swingably connected to said side panels for movement between a retracted position in which said side walls are supported on the upper ends of the side panels and an extended position in which said shelf assembly projects outwardly from said side panels with said top panel and top wall in coplanar relationship. Said side walls are also provided with rearwardly angled edges engageable with said rearwardly angled panel portions for supporting said shelf assembly in extended position.

3,703,325
FILING CABINET CONSTRUCTION

Howard A. Schnarr, Waterloo, Ontario, Canada, assignor to Massey-Ferguson Industries Limited, Ontario, Canada

Filed Nov. 13, 1969, Ser. No. 876,517
Int. Cl. A47b 88/00
U.S. Cl. 312—307 3 Claims

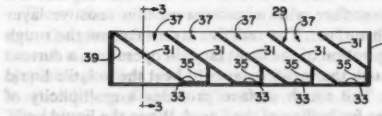


A filing cabinet is provided with pivotable and slidable doors which may be retracted within the cabinet to provide access to the roll-out file drawers. The doors comprise sheet metal envelopes closed at the ends by unitary plastic end caps which each include a handle depression, a locking tab, and a stop tab for locating the doors in the closed and retracted positions. The door front surface is substantially entirely planar and includes an internal rigidifying structural member so that in a partially retracted position, the door may be utilized as a posting shelf. The cabinet further includes means for indicating the partially retracted position of the door.

3,703,326
DRAWER DIVIDER AND DRAWER ORGANIZER

Marie Riviers, 117 River Street, Menasha, Wis.

Filed Aug. 9, 1971, Ser. No. 170,187
Int. Cl. A47b 88/20
U.S. Cl. 312—330 14 Claims

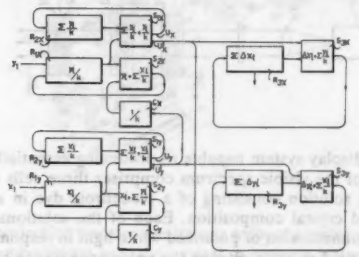


The invention relates to means for dividing the elongated, side-by-side, main compartments which are usually provided in kitchen utensil drawers, silverware drawers, silver storage chests and the like, or which are provided by elongated drawer organizer trays, into a series of forwardly and downwardly inclined, sub-compartments of particular form. Specifically, these sub-compartments, which are open at the top, have the general form of a parallelepiped which is rectangular in cross section and which is partially truncated at its lower, forward end. The wall surfaces defining the sub-compartments provide, for each sub-compartment, a rectangularly shaped, open top; a downwardly and forwardly inclined utensil supporting, lower surface; a flat, horizontal bottom surface which extends parallel to the bottom surface of the main drawer or chest compartment; a vertical surface which extend transversely of the sub-compartment; spaced, vertically extending, parallel, side walls; and a flat, downwardly and forwardly inclined, upper wall surface for the sub-compartment which is spaced from and is parallel to the downwardly and forwardly inclined, utensil supporting, lower surface.

3,703,327
NUMERICAL CONTROL DEVICES

Piero Pomella, Piazza Balla, 14, and Luciano Lauro, Stradale Turin, 411, both of Ivrea, Italy

Continuation-in-part of Ser. No. 47,388, June 18, 1970, abandoned. This application Aug. 10, 1971, Ser. No. 170,491
Claims priority, application Italy, June 21, 1969, 52341 A/69
Int. Cl. G05b 19/24
U.S. Cl. 318—571 18 Claims

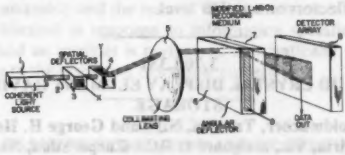


A numerical control device for positioning a movable member includes an interpolation unit which effects numerical control by circular interpolation, approximating the arc of a circle by a series of straight line segments. Referred to the origin of the circle, the incremental displacement components required to move from any point (x_i, y_i) on the circle are shown to be y_i/K along the x-axis and x_i/K along the y-axis, where K is a predetermined factor. The interpolation unit operates in a succession of phases corresponding to said segments and includes means to divide said coordinates (x_i, y_i) by K, and means for summing said resultants to form summations ($\Sigma x_i/K$, $\Sigma x_i/K$). The error in approximating to said arc is maintained below a predetermined maximum by starting a new interpolation phase whenever $\Sigma x_i/K$ or $\Sigma y_i/K$ reaches a predetermined value. The interpolation unit also includes means for summing the components Δx_i, Δy_i of the path segments corresponding to successive interpolation phases. To limit the speed of the member, the interpolation unit sums the incremental displacement components $(x_i/K, y_i/K)$ over a time cycle comprising several interpolation phases. The interpolation is stopped if the summation of either of the displacement components reaches a predetermined value corresponding to a maximum velocity component.

3,703,328
DEVICES UTILIZING IMPROVED $LiNbO_3$ HOLOGRAPHIC MEDIUM

Alastair Malcolm Glass, Millington, and George Earl Peterson, Short Hills, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 21, 1971, Ser. No. 164,506
Int. Cl. G02b 27/22
U.S. Cl. 350—3.5 9 Claims

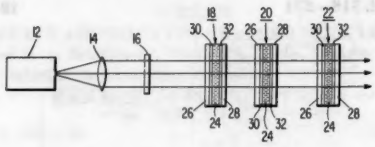


Volume holographic devices utilize lithium niobate, $LiNbO_3$, containing added iron ions. The added ions provide for improved resolution and contrast. Utilization is made of the improved material in devices designed for multiple image recording and readout. In a preferred embodiment, selection, as among images, is determined by the angle of incidence of the interrogating beam.

3,703,329
LIQUID CRYSTAL COLOR DISPLAY

Joseph Anthony Castellano, New Brunswick, N.J., assignor to RCA Corporation

Filed Dec. 29, 1969, Ser. No. 888,603
Int. Cl. G02f 1/26
U.S. Cl. 350—150 8 Claims

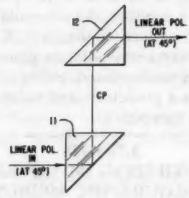


A color display system capable of producing essentially all the colors of the visible spectrum comprises three cells each including a solution consisting of a pleochroic dye in a nematic liquid crystal composition. Each of the solutions can change its transmission of polarized white light in response to an electric field so as to change the color appearance of the solution. One solution of the system can change in appearance from color less to magenta, another from colorless to cyan, and a third from colorless to yellow. The system includes means for applying an electric field separately to each of the solutions and means for passing polarized white light successively through each solution.

3,703,330
OPTICAL ROTARY JOINT

Philip J. Allen, North Forestville, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed June 15, 1971, Ser. No. 153,307
Int. Cl. G02f 1/24
U.S. Cl. 350—157 3 Claims



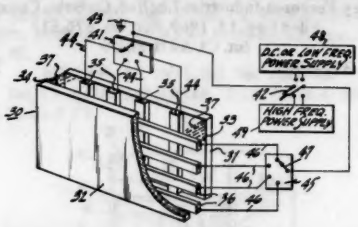
This disclosure is directed to means for transmitting a polarized optical beam between two parts of a system in relative rotation on different levels such that the output polarization does not change with relative rotation about a common axis. Such a system may be used for optical radar in which the laser transmitting is stationary on one level with the rotatable optical reflectors on another level.

3,703,331
LIQUID CRYSTAL DISPLAY ELEMENT HAVING STORAGE

Joel E. Goldmacher, Trenton, N.J., and George H. Heilmeier, Alexandria, Va., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 690,309, Dec. 13, 1967, abandoned. This application Nov. 26, 1971, Ser. No. 202,580
Int. Cl. G02f 1/16
U.S. Cl. 350—160 LC 10 Claims

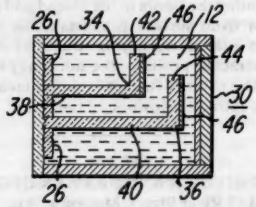
A liquid crystal element exhibiting storage of its light scattering state after removal of the electric current initiating the state comprises a mixture of cholesterol, a cholesterol derivative or a cholesteric liquid crystal compound with a nematic liquid crystal of the type that exhibits non-destructive turbulent motion when an electrical current of sufficient magnitude is passed therethrough.



3,703,332
LIGHT MODULATOR AND DISPLAY DEVICE

George William Taylor, Princeton, N.J., assignor to RCA Corporation

Filed March 30, 1971, Ser. No. 129,393
Int. Cl. G02f 1/30
U.S. Cl. 350—160 CR 10 Claims



A device which can be switched between a light-scattering and a non light-scattering condition comprises, in an element thereof, a volatile liquid and a container having a front viewing face and a darkened back face. The front viewing face has a rough inner surface with a transparent thin resistive layer over the rough surface. The resistive layer takes on the rough surface configuration of the front face. In operation, a current is passed through the resistive layer to heat the volatile liquid until it boils. The rough surface provides a multiplicity of nucleation sites for boiling of the liquid. When the liquid boils, the device scatters light and appears white to the viewer. When the liquid is in its quiescent state, light passes through the front face and the liquid without substantial scattering and the device appears dark due to the darkened back face.

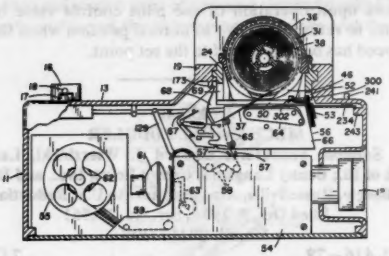
3,703,333
CINEMATOGRAPHIC CARTRIDGE PROJECTOR APPARATUS

John J. Bundschuh; Robert J. Roman, and Kenneth W. Thomson, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 643,502, June 5, 1967. This application May 13, 1970, Ser. No. 48,635
Int. Cl. G03b 1/56
U.S. Cl. 352—157 18 Claims

An apparatus, such as a cinematographic projector, for use with cartridges containing rolls of strip material and in which the cartridges may be selectively and/or automatically moved in sequence into operation position, the projector also being capable of use with individual cartridges containing rolls of strip material. In operating position the strip material is auto-

matically moved out of the cartridge by means of a stripper mechanism and directed to an automatic threading



mechanism of the apparatus, and then rewound into the cartridge after the strip material has been displayed.

3,703,334

ELECTROPHOTOGRAPHIC APPARATUS

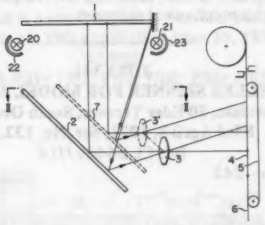
Wilhelm Josef Knechtel, Paulinen Str. 24, Rodheim, and Detlef Schaffer, Kornmarkt 6, Wetzlar, both of Germany

Filed July 13, 1970, Ser. No. 54,335

Claims priority, application Germany, July 14, 1969, P 19 35 617.3

Int. Cl. G03g *15/00*; G03b *27/34*

U.S. Cl. 355—11 **5 Claims**



The system includes a first mirror for reflecting light images onto the photosensitive member in first magnification and a second mirror selectively movable from an inoperative to an operative position for reflecting light images onto the member in second magnification different from the first magnification. The system also includes a lens selectively movable to focus the image applied to the photosensitive member by the operative mirror.

3,703,335

MULTIPLE EXPOSURE IMAGING APPARATUS

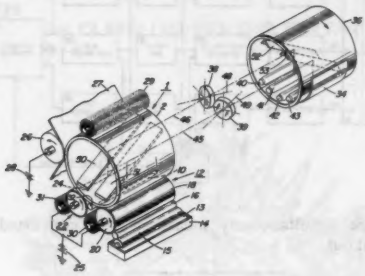
Sanford G. Hoffman, Rochester; Earl V. Jackson, Penfield; Gary K. Starkweather, and Edwin Zucker, both of Rochester, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Dec. 22, 1969, Ser. No. 887,453

Int. Cl. G03b *27/32*; G03g *15/00*

U.S. Cl. 355—51 **20 Claims**

A machine for automatically making a plurality of superposed exposures optical input from a moving object cylinder carrying a document to a synchronously moving transparent electro-conductive image cylinder for forming the images. Internal to both the cylinders is an optical system for projecting contiguous portions of the object onto a plurality of locations on the image cylinder each in superposed registration. The optical systems are aligned such that a presentation of a point from the object to the image cylinder at one portion of the surface is repeated at the same portion of the surface after the surface has moved from its original position. The optical systems each have a skewed lens and a plane and roof mirror



for projecting transferable images without keystone distortion. An embodiment uses the optical re-imaging system for forming photoelectrophoretic images.

3,703,336

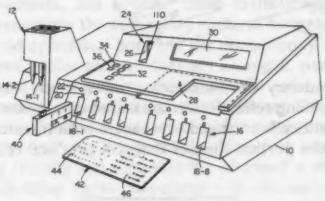
ANALYSIS SYSTEM EMPLOYING A PLURAL CHAMBER CUVETTE STRUCTURE

Thomas A. Rosse, Lexington; David E. Blackmer, Harvard; Jerrold Zindler, Cambridge, and Thomas F. Kelley, Canton, all of Mass., assignors to Instrumentation Laboratory, Inc., Lexington, Mass.

Filed June 12, 1970, Ser. No. 45,758

Int. Cl. G01n *21/24*

U.S. Cl. 356—39 **29 Claims**



An analysis system includes a plural chamber cuvette assembly that holds chemical materials and is adapted to receive an unknown to be analyzed in one of the chambers, a record that specifies information as to the nature of the stored chemical material and the type of analysis to be performed, and photometric instrumentation for performing a chemical analysis that responds to the material in the sample chamber in the cuvette assembly and the record. The instrument is automatically calibrated in response to information specified by the record and an analysis is performed automatically merely in response to the operation of a single control.

3,703,337

ANALYZER PROCESSING AND RECORDING TECHNIQUE

Eric Neugroschel, Fort Lee, N.J., and Alexander Scott Paterson, Nutley, N.J., assignors to Hoffmann La Roche Inc., Nutley, N.J.

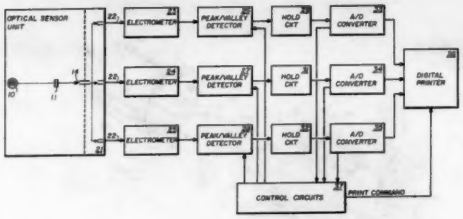
Filed Jan. 4, 1971, Ser. No. 103,546

Int. Cl. G01n *21/22*

U.S. Cl. 356—178 **9 Claims**

An apparatus and method for processing and recording data derived from a specimen analyzer for at least two charac-

teristics of the specimen where each of the characteristics is separately detected and stored and then all of the characteristics are simultaneously measured and converted for digital print out.



3,703,338

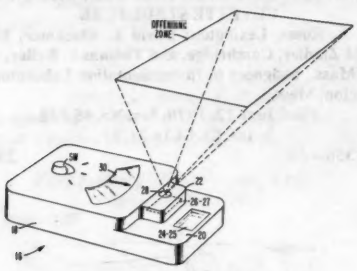
VEILING REFLECTION AND ILLUMINATION METER

Edwin J. Breneman, Wappingers Falls, N.Y., assignor to Kollmorgen Corporation, Hartford, Conn.

Filed May 6, 1971, Ser. No. 140,884

Int. Cl. G01j 1/42

U.S. Cl. 356—222 **2 Claims**



The tendency of illumination on a study desk task to produce veiling reflections is measured by a meter connected to two photocells arranged to measure both the total illumination and the portion thereof that will produce veiling reflections.

3,703,339

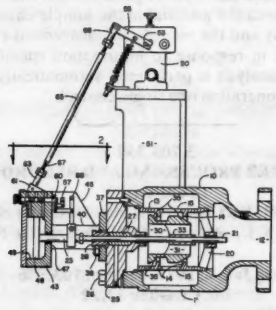
TURBINE SPEED CONTROL SYSTEM

Charles C. Czuszak, Greensburg, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Filed March 10, 1971, Ser. No. 122,846

Int. Cl. F01b 25/06

U.S. Cl. 415—36 **1 Claim**



In the speed control mechanism of this invention, the piston rod of a fluid operated Servo motor is connected to the steam supply valve. The turbine governor is directly connected to the pilot control valve of the Servo motor by a linkage assembly, a portion of which is connected to the piston rod and functions upon operation of the pilot control valve by the governor to return the valve to normal position when the turbine speed has been returned to the set point.

3,703,340

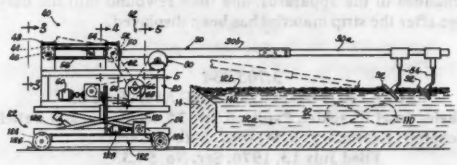
MECHANICAL PUDDLER

David Salmon, Frankfort; Edward J. Wierzbicki, Lansing, both of Ill.; Benny Langston, Crown Point, Ind., and Donald W. Beegle, Russellville, Ala., assignors to U.S. Reduction Co.

Filed Oct. 9, 1970, Ser. No. 79,561

Int. Cl. B01f 11/00

U.S. Cl. 416—79 **7 Claims**



A mechanical puddler for stirring a melt within a furnace and including an elongated member carried by a frame and having a stirring mechanism connected to a free end thereof with drive means cooperating with the member for moving the paddle in a closed loop having a figure eight configuration. The frame is capable of being raised and lowered relative to the upper surface of the melt and moved parallel to the surface to act as a mechanical skimmer.

3,703,341

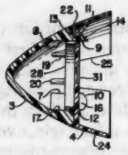
PROPELLER SPINNER FOR MODEL AIRPLANES

Dominic Garofalo, 50 Eder Terrace, South Orange, N.J.

Filed April 8, 1971, Ser. No. 132,400

Int. Cl. B64c 11/14

U.S. Cl. 416—245 **6 Claims**



An impact absorbing, economical to manufacture, easily installed and removed propeller spinner for model airplanes comprising a forward portion and a rear portion joined together through a self-aligning locking means with the blades of the propeller for the model airplane passing outwardly through the rear portion which is supported from the propeller shaft with the forward portion being supported from it.

3,703,342

FUEL PUMP BELLOWS CONSTRUCTION

Alton J. O'Connor, Cass City, Mich., assignor to Walbro Corporation, Cass City, Mich.

Filed July 30, 1971, Ser. No. 167,651

Int. Cl. F04b 35/00; F01b 19/00; B65d 37/00

U.S. Cl. 417—326 **9 Claims**

A one-piece pump bellows of a flexible, resilient material with a corrugated generally cylindrical sidewall having a plurality of interleaved outer and inner bends with interconnecting wall portions. The corrugated wall is not of uniform thickness and the thickness at the bends of the wall is greater

than the maximum thickness of the interconnecting wall portions. The thickness of the interconnecting wall portions immediately adjacent the bends is less than the maximum thickness of the interconnecting wall portions. The outer bends have associated pairs of opposed circumferential ribs on the inside surface of the interconnecting walls and the inner

bends have associated pairs of opposed circumferential ribs on the outside surface of the interconnecting walls. The pairs of opposed ribs are adapted to abut when the bellows is foreshortened by overstroking which decreases the maximum stress to which the bends are subjected and substantially increases the service life of the bellows.

3,703,343

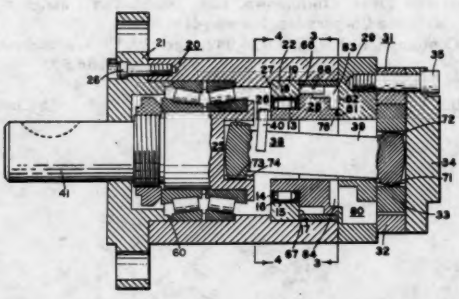
BEARING SUPPORT MEANS AND DRIVE FOR ROTARY VALVE IN FLUID PRESSURE DEVICE

George V. Woodling, 22077 West Lake Road, Rocky River, Ohio

Continuation of Ser. No. 829,268, June 2, 1969, Pat. No. 3,531,226, which is a continuation of Ser. No. 684,705, Nov. 21, 1967, abandoned. This application June 10, 1970, Ser. No. 44,998

Int. Cl. F01c *1/02*; F03c *3/00*; F04c *1/02*

U.S. Cl. 418—61 **5 Claims**



The rotary valve is especially adapted to operate in a fluid pressure device having a stator element and a rotor element constituting a fluid stator-rotor mechanism, in which the stator element has a fixed axis and in which the rotor element has a movable axis with said rotor element having a rotational movement about its own axis and an orbit movement about the fixed axis. The rotary valve has a hollow shaft extending therefrom. Bearing support mans having first and second sides rotatively supports the hollow shaft with the rotary valve disposed on the second side of the bearing support means. Actuating means drives the rotary valve from the rotor element with the actuating means engaging the hollow shaft from the first side of the bearing support means. The bearing support means preferably comprises anti-friction bearings. The actuating means may embody rotational phasing.

3,703,344

INTERNAL COMBUSTION ROTARY ENGINE

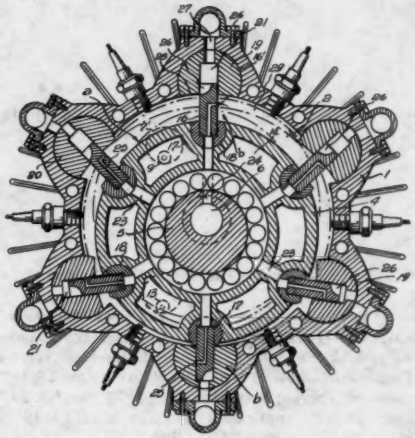
Teodoro Reitter, Fray Justo Sarmiento 2507, Buenos Aires, Argentina

Filed Jan. 27, 1971, Ser. No. 110,114

Claims priority, application Argentina, Jan. 30, 1970, 226719

Int. Cl. F01c *1/02*; F03c *3/00*; F04c *1/02*

U.S. Cl. 418—61 **3 Claims**



An improved internal combustion rotary engine, of the kind wherein a housing contains in a cylindrical bore a control body effecting an oscillating cycle creating a series of combustion chambers, has at least three crank-shaped bodies placed intermediate the contacting surfaces between the end covers of said cylindrical bore and the central body sides; said crank-shaped bodies are equidistantly arranged, partially and freely housed in respective recesses hollowed out in said covers, eccentric appendices of which, jutting out from the surfaces thereof, are freely included within respective recesses hollowed out from the central body sides, said central body also having radially and equidistantly arranged a plurality of swivelling dividing bodies associated with the surface of the housing internal cylindrical space; each of said dividing bodies, having a parallelepiped quadrangular and flattened configuration, is integral with a basic semi-circular cross-section body, freely included in a corresponding hollow of coincident cross-section cut off from the central body, while the upper portion of said dividing body swivellingly enters into a space offered by a further head body, also having a semi-circular cross-section and equally included in a coincident cross-section hollow existing in the housing wall; said dividing dividing basic and head bodies being interiorly provided with conduits associated with exhaust and injection operations.

3,703,345

APPARATUS FOR CONTINUOUS MIXING OF TWO LIQUID AGENTS TO OBTAIN A FOAMED SYNTHETIC PRODUCT

Herbert Giesemann, Don Boscostr. 3, 53 Bonn, Germany

Filed June 12, 1970, Ser. No. 45,761

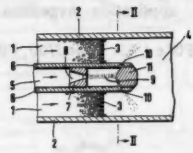
Claims priority, application Germany, June 12, 1969, P 19 29 887.4

Int. Cl. B29d *27/04*

U.S. Cl. 425—4 **13 Claims**

Apparatus for continuously forming a foamed synthetic resin product comprises concentric conduits for feeding foam material in the outer conduit and aqueous synthetic resin solu-

tion in the inner conduit. The inner conduit includes a nozzle and an impingement device for atomizing the stream of the



aqueous synthetic resin solution after which it is projected into the foam material to form the foam product.

3,703,346

MOLD FOR VULCANIZING PRE-SHAPED PNEUMATIC TIRES

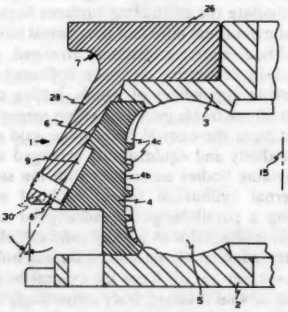
Francois Fernand Deboeur, Liege, and Leon Paul Jean Plumhans, Grivegnee-Liege, both of Belgium, assignors to Uniroyal Aktiengesellschaft, Aache-Rothe-Erde, Germany

Continuation-in-part of Ser. No. 92,699, Nov. 25, 1970, abandoned. This application Jan. 13, 1972, Ser. No. 217,489

Claims priority, application Germany, April 17, 1971, P 21 18 647.0; Nov. 29, 1969, P 19 59 982.7

Int. Cl. B29h 5/02

U.S. Cl. 425—46 **21 Claims**



This is a mold for vulcanizing pre-shaped tires, in which a plurality of tread-forming mold segments are axially and radially guided into "mold open" and "mold closed" positions, while achieving continuous extended guide surface engagement. A circular actuator slidingly supports the tread-forming mold segments in a circular distribution about the mold axis. Cooperating curved guide surfaces are formed on the actuator and on the segments, and are oriented parallel with the sliding direction of the segments. The curved guide surfaces are selectively inclined relative to the mold axis to obtain a radial component of mold segment motion with axial movement of the actuator. Extended curved surface contact between guide surfaces is maintained throughout mold opening and closing motion, to achieve enhanced structural support and restrict the entry of dirt between the guide surfaces.

3,703,347

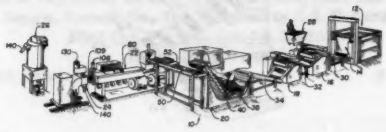
WASTE RECOVERY OF THERMOPLASTIC CONTINUOUS FILAMENTARY MATERIAL

Robert Hester, and Howard P. Pierson, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 27, 1970, Ser. No. 67,324

Int. Cl. B29d 7/02; B29f 3/02

U.S. Cl. 425—67 **12 Claims**



Apparatus for recovering waste thermoplastic fiber of continuous length filamentary material and converting it into re-useable feed stock and particularly a large otherwise unmanageable, entangled mass of continuous length filamentary material, some or all of which being either drafted or undrafted, wherein the continuous length filamentary material is converted into random length staple fiber, the staple fiber is then mechanically compacted and melted into a melt flow, and the melt flow is finally extruded as the re-useable feed stock.

3,703,348

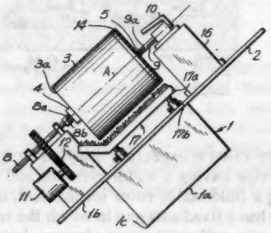
APPARATUS FOR MOLDING HOLLOW OBJECTS FROM THERMOPLASTIC MATERIALS

Stewart Pivar, Muttontown, Long Island, N.Y., assignor to Rototron Corporation, Farmingdale, N.Y.

Continuation of Ser. No. 724,082, April 29, 1968, abandoned. This application Oct. 27, 1970, Ser. No. 84,503

Int. Cl. B29c 5/04

U.S. Cl. 425—173 **6 Claims**



Apparatus is provided for molding thermoplastic articles in hollow form in which a frame or stand is provided which has two stable positions. These are selectively employed to hold a mold in inclined or horizontal attitudes, the mold being provided with an open end on which is placed a cover with an opening therein so that access to the interior of the mold is possible. Thermoplastic material is placed in the mold which is

heated so that the material fuses to the mold and the article is thereby formed. Access to the interior of the mold permits improved control over the formation of the objects being molded and permits various possibilities such as forming articles with stripes therein or with mechanical parts incorporated into the object.

3,703,349

GROUND FLARE

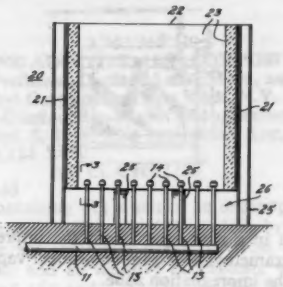
John F. Straitz, III, Cheltenham, Pa., assignor to Combustion Unlimited, Incorporated, Elkins Park, Pa.

Filed May 17, 1971, Ser. No. 143,947

Int. Cl. F23d

U.S. Cl. 431—202 **6 Claims**

A ground flare is provided for incinerating waste combustible gas from refineries and the like in which the waste gases are conducted underground to and through horizontal gas supply pipes on which vertical gas supply pipes having nozzles at their upper ends are mounted. The nozzles deliver the gases for burning within a refractory lined vertical rectangular enclosure to which air is admitted at the bottom and the



products of combustion discharged at the top, the flare being free from operating difficulties heretofore encountered.

CHEMICAL

3,703,350

DYEING SYNTHETIC POLYAMIDES WITH 1,4-DI-(HYDROXYALKYLAMINO)ANTHRAQUINONES

Paul Buecheler, Reinach, Basel-Land, and Karl Ulrich Steiner, Binningen, Basel-Land, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

No Drawing. Filed June 29, 1970, Ser. No. 50,955

Claims priority, application Switzerland, July 18, 1969, 11,032/69

Int. Cl. C09b *1/28;* **D06p** *1/20*

U.S. Cl. 8—39 **9 Claims**

A process for the dyeing and printing of synthetic polyamides with dyes of the 1,4-di-(hydroxyalkylamino)-anthraquinone series, in which the synthetic polyamides may be present in the form of filament, yarn or in any of the textile forms produced therewith.

3,703,351

TWO STEP MODIFICATION OF TEXTILE MATERIALS

Michael V. Lock, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

No Drawing. Continuation of application Ser. No. 691,655, Dec. 18, 1967, which is a continuation-in-part of application Ser. No. 244,275, Dec. 13, 1962. This application Feb. 20, 1970, Ser. No. 14,712

Int. Cl. D06m *15/54, 15/70*

U.S. Cl. 8—116.3 **5 Claims**

Textiles composed of cellulosic fibers or blends of cellulosic and synthetic fibers are modified to improve the flat drying properties thereof through treatment with polyfunctional reactants having at least one acid catalyzable and at least one alkaline catalyzable group. Either the acid catalyzed or the alkaline catalyzed reaction may be conducted first. The reactions may be conducted in the wet or dry state. The alkaline catalyst used may be one which is substantially neutral when initially applied to the textile but becomes strongly alkaline at elevated temperatures. A reducing agent may be added to the treating bath to inhibit yellowing of the textile material under curing conditions. An aminoplast resin may be included in the treating bath. Active hydrogen containing compounds may be appended to the textile through reaction with reactive groups bound to the textile by the initial reaction between the polyfunctional compound and the textile.

3,703,352

TREATMENT OF KERATINOUS FIBRES AND FABRICS

Bryan Dobinson, Duxford, Paul Hope, Saffron Walden, Kenneth Winterbottom, Whittlesford, and Trevor Shaw, Ilkley, England, assignors to Ciba-Geigy AG, Basel, Switzerland, and I.W.S. Nominee Company Limited, London, England

No Drawing. Filed Nov. 9, 1970, Ser. No. 88,246

Claims priority, application Great Britain, Nov. 14, 1969, 55,992/69

Int. Cl. D06m *3/02*

U.S. Cl. 8—128 A **20 Claims**

A process for modifying keratinous material which comprises

(1) treating the material with an ester which contains at least two mercaptan groups per molecule and which is a product of the reaction of

(a) at least one monomercaptomonocarboxylic acid or monomercaptomonohydric alcohol,

(b) at least one compound containing, per molecule, at least two alcoholic hydroxyl groups or at least one 1,2-epoxide group, and

(c) at least one compound containing, per molecule, at least two carboxylic acid groups, or an anhydride thereof, and

(2) curing the ester on the material.

By this process the keratinous material is rendered resistant to shrinkage, and durable press characteristics are imparted to it. Keratinous material so treated is washable without essential lost of its finish and keeps its smooth handle.

3,703,353

GASEOUS DIFFUSION PAPER DEACIDIFICATION

James E. Kusterer, Jr., and John D. Hind, Richmond, Va., assignors to Council on Library Resources, Inc., Washington, D.C.

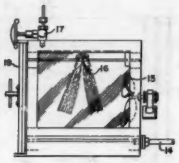
Filed Apr. 15, 1971, Ser. No. 134,309

Int. Cl. A61l *13/00*

U.S. Cl. 21—58 **17 Claims**

Paper, for example having a pH of about 5.0 or lower, is rendered resistant to the deterioration that is promoted by acidic conditions in paper by impregnating the paper, for example in the form of a book, with gaseous hexamethylenetetramine. Preferably, the hexamethylenetetramine is formed by reacting gaseous ammonia with gaseous

formaldehyde, and such reacting can either be effected while the reactants are in contact with the paper or be carried out in a zone apart from the impregnation zone and the hexamethylenetetramine product vapors then conducted to the impregnation zone.



ERRATUM

For Class 21—2.5 see:
Patent No. 3,703,587

3,703,354
METHOD OF PRODUCING HYDRAZINE

Nikolai Timofeevich Denisov, Oleg Nikolaevich Efimov, Viktor Fedorovich Shuvalov, and Natalia Ivanovna Shuvalova, Moskovskaya Oblast, and Alla Konstantinovna Shilova and Alexandr Evgenievich Shilov, Moscow, U.S.S.R., assignors to Filial Ordena Lenina Institut Khimicheskoi Fiziki ANSSR, Moskovskaya, U.S.S.R.

No Drawing. Filed Aug. 26, 1970, Ser. No. 67,218
Claims priority, application U.S.S.R., Jan. 12, 1970, 1,387,563
Int. Cl. C01c *1/00*
U.S. Cl. 423—407 **7 Claims**

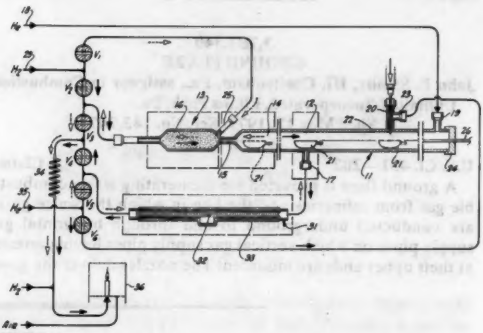
Gaseous nitrogen is reduced by reducing agents which are chlorides or sulphates of trivalent titanium, bivalent chromium, or bivalent vanadium, in the medium of water, methanol, ethanol, or a mixture of said solvents. The temperature of the process is 20–100° C., nitrogen pressure is 1–150 atm., pH of the medium is not lower than 8. In case of using compounds of the two said first metals as reducing agents, the process is carried out in the presence of molybdenum pentachloride, molybdenum oxytrichloride, sodium molybdate or potassium molybdate. Said method ensures an increase in the yield of the desired product for the reducing agent employed (up to 75 mol. percent) and allows the use of reducing agents that are not sensitive to moisture and easy to regenerate, as well as the use of inexpensive solvents.

3,703,355
PYROLYSIS AND ANALYSIS SYSTEM

Yoshihiro Takahashi, San Francisco, Robert T. Moore, Palo Alto, and Thomas M. Stephens, Menlo Park, Calif., assignors to Dohrmann Division, Envirotech Corporation, Mountain View, Calif.

Filed Dec. 10, 1971, Ser. No. 206,839
Int. Cl. G01n *31/10, 31/12*
U.S. Cl. 23—230 PC **28 Claims**

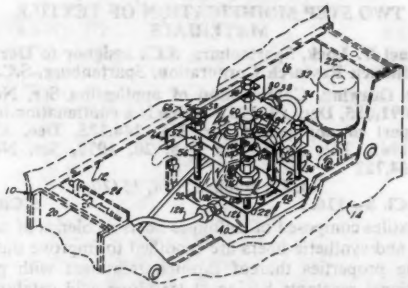
A method and apparatus for directly selectively analyzing organic carbon or other predetermined compounds in a sample-containing fluid such as wastewater. The organic carbon in the wastewater sample is either oxidatively pyrolyzed to carbon dioxide or reductively pyrolyzed to methane, which products are then analyzed. Prior to pyrolysis, the inorganic carbonate and bicarbonate salts present in the water are removed by acidification to carbonic acid and vaporization of the carbon dioxide component in a volatilization zone. The vapors, including certain volatile organic carbon compounds, are directed in a carrier gas through a packed detention column for sorption of the organic carbon compounds on the packing while the carbon dioxide is vented. Thereafter the carrier gas flow is reversed and the sorbed compounds are desorbed and conveyed to a pyrolysis zone wherein they are pyrolyzed along with the unvaporized sample and converted to a gaseous pyrolysis product which is quantitatively analyzed. The wastewater may be supplied in a boat to the volatilization zone and the boat moved into the pyrolysis zone during pyrolysis.



3,703,356
PORTABLE FLAME IONIZATION GAS LEAK DETECTOR

Bob A. Carter, Atlanta, Ga., assignor to Southern Cross Corp., Atlanta, Ga.

Filed Jan. 20, 1971, Ser. No. 107,970.
Int. Cl. G01n *31/12*
U.S. Cl. 23—254 EF **7 Claims**



A detector unit for a portable flame ionization gas leak detector operating from relatively low voltage battery power and typically capable of field operation in excess of one day without recharging the fuel supply or the battery power supply. The basic electronic circuitry primarily utilizes solid state devices and a meter or other detection device is tied across two points of circuitry utilizing a principle similar to the well known electronic Wheatstone bridge employing electronic devices in each of four legs which may be resistors, capacitors, field effect transistors or other devices which react to non-electronic

conditions such as thermocouples or ion chambers. The bridge is electronically balanced and the portion known as a detector side is set up to vary its electronic characteristics relative to the outside influence the circuit intends to detect. A change in the outside influence will unbalance the bridge causing current to flow thus indicating detection. The combination of very low voltage and extremely high resistors make the unit susceptible to varying temperature and humidity conditions which is minimized through the use of the physical inclusion of a portion of the bridge circuit inside an ion cell in the physical form of a plastic cylinder capped by two heavy plastic caps one on each end with suitable sealing means and gasketing at the points of closure. Electrical terminals are sealed in the plastic and suitable conduits are provided through the plastic for the entry of the gas. Resistors and other components are mounted on a small circuit board inside the cylindrical housing along with the flame detection component.

3,703,357

PROCESS FOR THE PREPARATION OF RUTILE TITANIUM DIOXIDE NEEDLES

Joseph P. Surls, Walnut Creek, David L. Bauer, Concord, and Ben F. West, Antioch, Calif., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 847,459, Aug. 4, 1969. This application July 28, 1971, Ser. No. 166,999

Int. Cl. C01g *23/04*

U.S. Cl. 423—611 **9 Claims**

Disclosed is a process which involves treating a titanium dioxide composition comprising monocrystalline rutile needles having axial ratios of greater than 20 and diameters of from 0.01 to 0.20 micron in admixture with nonrutile titanium dioxide particles with a solution of hydrochloric, nitric or perchloric acid at a temperature of greater than 200° C. The process provides as a product monocrystalline rutile titanium dioxide needles having axial ratios of greater than 20 and diameters within the range of from 0.04 to about 0.3 micron. The product of the present process is an excellent opacifier for disperse systems and is superior to known titanium dioxide products as a reinforcement material for certain plastics and metals.

3,703,358

METHOD OF GENERATING HYDROGEN WITH MAGNESIUM REACTANT

William N. Carson, Jr., Schenectady, and James L. Manganaro, New York, N.Y., assignors to General Electric Company

Original application Oct. 10, 1967, Ser. No. 674,159. Divided and this application Aug. 21, 1969, Ser. No. 852,017

Int. Cl. H01m *29/04*; C01b *1/03*

U.S. Cl. 423—657 **1 Claim**

A method of generating hydrogen is described which has a magnesium reactant and an aqueous electrolyte with a dewatering agent. A method is also described for generating hydrogen. The dewatering agent reduces substantially the volume of magnesium hydroxide precipitation within the cell during its operation by freeing water from the precipitate thereby increasing its density.

3,703,359

POLYMERIC AMINO ALUMINUM BOROHYDRIDE AND METHOD OF PREPARING

Stelvio Papetti, Hamden, Conn., assignor to Olin Mathieson Chemical Corporation

No Drawing. Filed Jan. 31, 1961, Ser. No. 86,232

Int. Cl. C01b *35/00*

U.S. Cl. 423—284 **9 Claims**

Polymeric amino aluminum borohydride,

$$(BH_4)_2AlNH_2$$

is provided by reacting R_3Al, where R is an alkyl group having from 1 to 5 carbon atoms, successively with ammonia and diborane.

3,703,360

GASOLINE ADDITIVE AND COMPOSITION

Warren L. Perilstein, Orchard Lake, Mich., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 856,147, Sept. 8, 1969. This application Aug. 21, 1970, Ser. No. 66,124

Int. Cl. C10l *1/22*

U.S. Cl. 44—63 **61 Claims**

Gasoline containing (1) a salt of an organophosphoric acid and an organic amine, and (2) an olefin hydrocarbon having an average molecular weight of from about 350 to about 1500; and an additive concentrate which is a combination of (1) and (2). The gasoline composition prevents and reduces excessive deposit build-up in internal combustion engines particularly on the underhead portion of the intake valves. The composition also is an effective carburetor detergent.

3,703,361

DECAHYDROACENAPHTHENE AS A HIGH ENERGY FUEL

Milton S. Konecky, South Plainfield, N.J., assignor to Esso Research and Engineering Company

No Drawing. Continuation-in-part of application Ser. No. 65,887, Oct. 31, 1960, now Patent No. 3,450,781. This application Oct. 23, 1968, Ser. No. 770,119

Int. Cl. C10l *1/08*

U.S. Cl. 44—80 **12 Claims**

Decahydroacenaphthene is both an excellent high energy fuel and coolant in rockets, or in standard jet-engines.

3,703,362

PRESENSITIZED LIGHT-SENSITIVE LETTERPRESS PRINTING MAKEREADY

Daniel S. Dustin, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 17, 1972, Ser. No. 218,238

Int. Cl. G03c *5/00, 11/00*

U.S. Cl. 96—38.2 **8 Claims**

Novel presensitized light-sensitive makeready sheet material for letterpress printing is provided. This sheet material is comprised of a flexible backing overlaid in ascending order with a thermoexpansible layer, a light-sensitive diazo resin layer, and an outer layer of a pigmented, water-insoluble, solvent-softenable polymeric compound.

3,703,363

METHOD AND APPARATUS FOR MAKING GLASS CONTAINERS

Richard A. Heaton, Toledo, and James D. Mallory, Maumee, Ohio, assignors to Owens-Illinois, Inc.

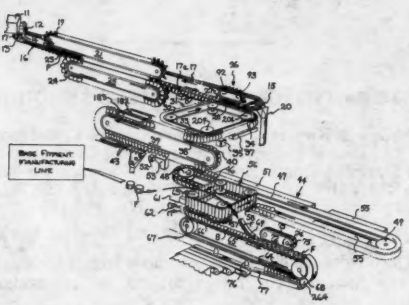
Filed Apr. 1, 1970, Ser. No. 24,721

Int. Cl. C03b *9/10, 9/12*

U.S. Cl. 65—67 **39 Claims**

The invention pertains to a manufacturing system for producing multi-part containers in which one part of glass is assembled with a plastic part to form a final composite container. The glass part is manufactured from a continuous ribbon of molten material drawn from a glass furnace and the glass in the ribbon is formed at equally spaced longitudinal distances therealong and maintained with conveyors moving at a constant velocity throughout the process during which successive finishing operations are performed on the glass container. After the glass is fed from the furnace, successive operations are performed

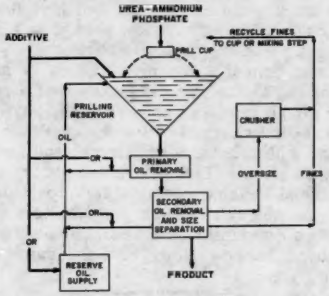
while the glass progressively cools to: (a) form a continuous ribbon, (b) shape successive hollow containers from the ribbon, inspect and eject defective containers from the ribbon, (c) sever the containers from the ribbon and simultaneously prevent entry of foreign particles into them, (d) move the containers by a moving transfer conveyor to a burn-off machine and apply a surface treatment to the containers while in transit, (e) convey them through a linear burn-off device to simultaneously remove a waste moile portion from the outer end of the article and form the mouth, thereafter inspect and eject defective ones, (f) transfer the glass containers with a finished mouth or rim to a heat treating machine and successively heat and cool the necks and finishes of the containers, (g) transfer the heated containers to an assembly machine and, in transfer, inspect the containers, apply a surface treatment thereto, and reject defective containers, and (h) assemble and bond a plastic cup-like base element onto the bottom end of the containers to form a composite container.



The invention also includes apparatus combined with a glass ribbon machine. The apparatus includes a transfer machine that receives ware from the ribbon machine after crack-off; a burn-off machine of a unique, linear type, which receives ware from the transfer machine and by thermal means removes an outer end moile from the glassware and forms a bead type finish; a linear heat-treat machine that tempers the end portion of the ware near the newly formed bead finish; a transfer and inspection machine which removes ware from the heat-treat machine and rejects any defective ware; and a composite assembly machine that finishes the composite container by applying or uniting a plastic element onto the surface of the glassware near its bottom end. The machines are synchronized in phase and speed by a unique system.

3,703,364
PRODUCTION OF OIL-PRILLED FERTILIZER MATERIALS
John E. Jordan, Sheffield, Ala., assignor to Tennessee Valley Authority
Continuation of application Ser. No. 67,878, Aug. 28, 1970. This application Apr. 8, 1971, Ser. No. 132,371
Int. Cl. C05b *19/02*
U.S. Cl. 71—29 **5 Claims**

Process for oil prilling urea and/or urea-ammonium phosphates. Improvements include increased oil removal from the products by (1) including small amounts of additives in the oil prilling bath, (2) selecting a prilling bath oil having a low viscosity and, (3) washing the oil-prilled products during the oil removal process. Methods result in products of enhanced value because of the lowered oil content. Additives include certain fatty acids. Washing media include methyl alcohol and phosphoric acid. Prilling bath oil is selected from naphthenic and/or



METHODS OF INCORPORATING ADDITIVES IN OIL PRILLING PROCESS FOR PRODUCTION OF UREA-AMMONIUM PHOSPHATES

isoparaffinic based hydrocarbons, for prevention of urea adduct formation in the production of liquid fertilizer.

3,703,365
FRUIT ABSCISING METHOD
Shogo Takahashi, Takayasu Yamada, and Hiromi Okudaira, Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan
No Drawing. Filed Feb. 13, 1970, Ser. No. 11,356
Claims priority, application Japan, Feb. 22, 1969, 44/13,496
Int. Cl. A01n *9/36*
U.S. Cl. 71—86 **3 Claims**

Fruit abscising composition for facilitating the harvest of fruit which comprises as an active ingredient a compound having the formula

$$(RO)_3P{=}X \qquad (I)$$

wherein R is hydrogen atom; an alkyl group having 1 to 4 carbon atoms, e.g. methyl, ethyl, propyl, butyl; a haloalkyl group having 1 to 4 carbon atoms in the alkyl moiety, e.g. 2-chloroethyl, 2-bromoethyl, 3-chloroethyl; an alkenyl group having 2 to 4 carbon atoms, e.g. vinyl, allyl; phenyl group or benzyl group provided that at least one of the R's is the above-defined group other than hydrogen atom; and X is oxygen atom or sulfur atom and the salt thereof, e.g. an alkali metal, alkaline earth metal, copper, zinc, ammonium or organic amine salt.

The method for facilitating the harvest of fruit by accelerated abscission layer formation which comprises applying to fruited trees, an effective amount to accelerate fruit abscission of said compound (I) or the salt thereof.

3,703,366
PROCESS FOR PRODUCING COPPER AND ELEMENTAL SULFUR
John T. Cullom, 628 6th Ave., San Manuel, Ariz. 85631
Filed Nov. 20, 1970, Ser. No. 91,298
Int. Cl. C01b *17/04*; C22b *13/06*
U.S. Cl. 75—74 **15 Claims**

An integrated process is disclosed for recovering copper and elemental sulfur from sulfidic copper ore, the

effluent flue gases of the process being substantially free of sulfur dioxide and other sulfurous gases. In the process the sulfidic copper ore is ground autogenously to produce a finely divided flotation feed material that is subjected to froth flotation to obtain a copper ore concentrate and siliceous flotation tailings. The copper ore concentrate is mixed and nodulized with a carbonaceous fuel and a flux to produce autogenous smelting nodules. The nodules are smelted autogenously and the resulting molten matte and slag are converted to molten blister copper and converter slag by blowing the heated nodules, matte and slag with an oxidizing gas in a converter. The blister copper is recovered as one product of the process, and the converter slag is cast in the form of grinding boulders which are utilized as the grinding medium in the autogenous grinding step of the process. The sensible heat of the hot converter gas is utilized to supply the thermal energy requirements of a catalytic reformer in which steam and methane are reacted to produce hydrogen and carbon oxides. The resulting hydrogen is reacted with the sulfur dioxide content of the converter gas to produce hydrogen sulfide gas, and this hydrogen sulfide is reacted with a further quantity of sulfur dioxide to produce elemental sulfur which is recovered as the second product of the process. The converter gas is substantially depleted in its sulfur dioxide content and may safely be discharged into the atmosphere.

3,703,367

COPPER-ZINC ALLOYS

Franklin H. Cocks, Waltham, Mass., assignor to Tyco Laboratories, Inc., Waltham, Mass.

No Drawing. Filed Dec. 4, 1970, Ser. No. 95,347
Int. Cl. C22c *9/04, 9/06*
U.S. Cl. 75—157.5 **6 Claims**

Improved copper-zinc alloys containing titanium together with aluminum or nickel or both. If the amounts of titanium, aluminum, and nickel are kept with certain limits, the alloys are age-hardenable and a method is provided for heat treating such alloys to achieve a significant increase in hardness and strength properties. By increasing the amounts of titanium, aluminum, and nickel, it is possible to achieve alloys that are extremely hard after solution heat treating or casting.

3,703,368

METHOD FOR MAKING CASTABLE CARBONITRIDE ALLOYS

Erwin Rudy, Beaverton, Oreg., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

No Drawing. Filed Nov. 3, 1970, Ser. No. 89,222
Int. Cl. C22c *15/00*
U.S. Cl. 75—175.5 **19 Claims**

A method for fabricating improved cast refractory tooling materials is disclosed which comprises preparing a melt of titanium-tungsten-carbon-base alloy compositions $(Ti_xW_{1-x})C_z$, or titanium-tungsten-nitrogen-carbon base alloy compositions $(Ti_xW_{1-x})(N_yC_{1-y})_z$ under a nitrogen-containing atmosphere, in which the mole fraction x is variable between the limits 0.25 and 0.70, the mole fraction y is less than 0.50, the stoichiometry parameter z, which measures the combined gramatoms of nitrogen and carbon present per gramatom metal in the alloy, is variable between 0.25 and 0.45, and rapidly cooling the melt to form a carbonitride-metal alloy composite having a fine-grained microstructure consisting of a refractory, hard carbonitride phase and a metal phase, with the metal phase being rich in tungsten and contributing toughness to the composite and the carbonitride phase having titanium as its base metal.

3,703,369

CHROMIUM-CONTAINING BODIES OF IMPROVED RESISTANCE TO OXIDATION AND NITRIFICATION

Alan U. Seybolt, Ballston Spa, N.Y., assignor to General Electric Company

Application Jan. 17, 1967, Ser. No. 609,931, which is a continuation-in-part of application Ser. No. 524,439, Feb. 2, 1966. Divided and this application Dec. 5, 1969, Ser. No. 882,726
Int. Cl. B22f *1/00*
U.S. Cl. 75—206 **3 Claims**

Chromium-containing alloy sintered bodies having improved resistance to oxidation and nitrification are produced by a process which includes the step of heating the bodies to an elevated temperature in the presence of free oxygen and thereby forming a Cr_2O_3 scale on the bodies and a chromium ion migration-blocking layer of $YCrO_3$ at the interface of the Cr_2O_3 scale and the metal bodies.

ERRATUM

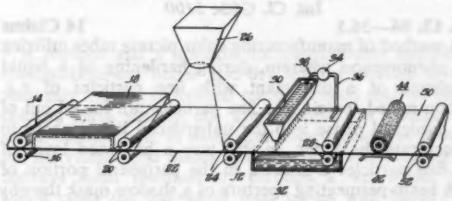
For Class 96—38.2 see:
Patent No. 3,703,362

3,703,370

PRODUCTION OF BLACK AND WHITE PRINTS FROM COLOR TRANSPARENCIES BY ELECTROSTATIC PROCESS

Meyer L. Sugarman, Northbrook, and Thomas A. Wilkie, Evanston, Ill., assignors to Opto/Graphics, Inc., Kenilworth, Ill.

Filed July 22, 1969, Ser. No. 843,468
Int. Cl. G03g *13/00, 9/04*
U.S. Cl. 96—1 LY **1 Claim**



Dyes are blended with a zinc oxide and resin mix before application to a paper or other printing base for electrostatic printing. The dyes are selected to render the paper essentially panchromatic, whereby direct black and white prints are made at low cost from a color transparency.

3,703,371

PHOTOCONDUCTIVE ELEMENTS CONTAINING POLYMERIC BINDERS

Stewart H. Merrill, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation of application Ser. No. 772,370, Oct. 16, 1968. This application Sept. 30, 1971, Ser. No. 185,397
Int. Cl. G03g *5/06, 5/08*
U.S. Cl. 96—1.6 **16 Claims**

Photoconductive elements containing a photoconductor and a binder for the photoconductor comprising a poly-(alkylidenebisaryloxyalkyl-co-alkylene isophthalate) are described. The described elements can be sensitized and charged either negatively or positively and used to prepare images electrophotographically.

3,703,372
PHOTOCONDUCTIVE ELEMENTS CONTAINING POLYMERIC BINDERS
Stewart H. Merrill, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Continuation of abandoned application Ser. No. 779,201, Nov. 26, 1968. This application Nov. 4, 1971, Ser. No. 195,853
Int. Cl. G03g *5/06, 5/08*
U.S. Cl. 96—1.6 **12 Claims**

Photoconductive elements containing a photoconductor and binder for the photoconductor comprising a certain class of polyesters having aryleneoxy repeating units are described. The described elements can be sensitized and charged either negatively or positively and used to prepare images electrophotographically.

3,703,373
PROCESSES AND ELEMENTS FOR PREPARATION OF PHOTOMECHANICAL IMAGES
Michael John Alsup and Alfredo Ruben Guevara, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed June 15, 1970, Ser. No. 46,525
Int. Cl. G03c *11/12*
U.S. Cl. 96—28 **21 Claims**

A dry process for the preparation of photomechanical images is described which employs as the photosensitive material a plasticized light sensitive polymer.

3,703,374
METHOD OF MANUFACTURING COLOR PICTURE TUBE
Tadao Okabe, Hachioji, Mitsuru Oikawa, Tokyo, Makoto Tanaka, Musashino, and Waichi Nagashiro, Kokubunji, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 6, 1970, Ser. No. 78,372
Claims priority, application Japan, Nov. 9, 1969, 44/80,793; May 25, 1970, 45/44,040, 45/44,041
Int. Cl. G03c *5/00*
U.S. Cl. 96—36.1 **14 Claims**

A method of manufacturing color picture tubes utilizing the phenomenon wherein, during hardening of a liquid consisting of a dispersant with fine particles of e.g. carbon mixed therein, the fine particles are forced out of the hardened phase into the unhardened liquid phase to concentrate the latter. In this way a hardened layer of the fine particles is formed in the peripheral portion of each beam-permeating aperture of a shadow mask thereby to temporarily make smaller said shadow mask beam-permeating aperture. This shadow mask is used to provide a phosphor screen formed by phosphors of the three primary colors. Thereafter, the shadow mask has said hardened layer in each beam-permeating aperture removed, and is assembled into the tube.

3,703,375
PHOTOGRAPHIC PROCESSES AND MATERIALS
Nicholas H. Groet and Wilho M. Salminen, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Continuation of applications Ser. No. 717,912, Apr. 1, 1968, Ser. No. 717,921, Apr. 1, 1968, and Ser. No. 717,925, Apr. 1, 1968, all now abandoned. This application Nov. 3, 1970, Ser. No. 86,609
Int. Cl. G03c *1/40*
U.S. Cl. 96—100 **34 Claims**

Photographic silver halide emulsions have incorporated therein a first colorless, non-diffusible photographic second coupler, upon reaction with oxidized color developer, forms a non-diffusible dye image; a second colored, non-diffusible photographic coupler having an azo chromophoric group in its coupling position, which second coupler, upon reaction with oxidized color developing agent, forms dye and releases the azo group; and, a third colorless, non-diffusible photographic coupler having a monothio group in its coupling position, which third coupler, upon reaction with oxidized color developer, forms a dye and a diffusible mercaptan development inhibitor.

The emulsions may have incorporated therein finely divided liquid particles of water insoluble coupler solvent, which particles contain the indicated combination of couplers. The emulsions may be prepared by dispersing the colorless, colored and DIR couplers in photographic coupler solvent, and dispersing the solution of coupler solvent into the emulsion.

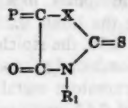
3,703,376
INDUCTION IMAGING SYSTEM
Robert W. Gundlach, Victor, and Richard C. Vock, Ontario, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Continuation-in-part of abandoned application Ser. No. 697,084, Jan. 11, 1968. This application June 29, 1970, Ser. No. 50,763
Int. Cl. G03g *13/22, 15/22*
U.S. Cl. 96—1 R **30 Claims**

The invention relates to an induction imaging system suitable to accomplish development of an electrostatic latent image at a point remote from the photosensitive surface on which the latent image is originally formed. In one embodiment, an image support member bearing an electrostatic latent image is presented to a self-supporting film in the form of a continuous induction web, an image being thereby induced in the web, developed thereon and subsequently transferred to a receiver material. The continuous induction web may be charged with a negative, positive, ground or alternating potential while in contact with the image support member depending on the polarity of the electrostatic latent image on the image support member; or the continuous web may not be externally charged where only line copy reproduction is desired.

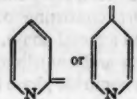
In another embodiment of the invention, an image support member carrying an electrostatic latent image is presented to a receiver material having a bulk resistivity in the range of from about 10^7 to 10^{14} ohm-cm. An electrostatic image is induced in the receiver material, developed thereon and fixed thereto or transferred to a secondary copy sheet material and fixed thereon.

3,703,377
SUPERSENSITIZED LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC EMULSION
Kaiichiro Sakazume, Tokyo, Eiichi Sakamoto, Hanno, Shigemasa Itoh and Noboru Fujimori, Tokyo, and Shigeji Baba, Zam-machi, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Filed Dec. 23, 1970, Ser. No. 101,066
Claims priority, application Japan, Jan. 16, 1970, 45/3,820
Int. Cl. G03c *1/08*
U.S. Cl. 96—122 **5 Claims**

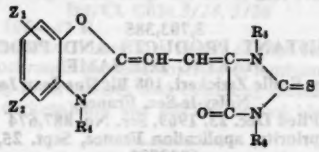
The emulsion contains at least one compound of the formula



wherein P is



R_2 and R_3 are individually an alkyl group; X is S, O, N, or N—R wherein R is hydrogen, an alkyl group or a lower alkyl group; and R_1 is an alkyl, allyl or aryl group, in combination with at least one compound of the formula



wherein R_4 is an alkyl group; R_5 and R_6 are individually an alkyl or aryl group; and Z_1 and Z_2 are individually a hydrogen or halogen atom or an alkyl, alkoxy or aryl group, said Z_1 and Z_2 may link to each other to form a benzene ring. The emulsion when subjected to supersensitization displays ideal color sensitivity.

ERRATUM

For Class 96—108 see:
Patent No. 3,703,584

3,703,378
SNACK FOOD AND METHOD OF PRODUCING SAME
Edward E. Bretch, Berwick, Pa., assignor to Borden, Inc., New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 676,716, Oct. 20, 1967. This application June 30, 1970, Ser. No. 51,369
Int. Cl. A23l *1/00, 1/10*
U.S. Cl. 99—81 **15 Claims**

Production of snack food products which expand upon baking or frying by heating a mix of a starch component and acylated high amylose starch as an expansion prevention agent to gelatinize the starch, cooling the mix to below gelatinization temperature and promptly thereafter shaping the mix into units of the shape desired.

3,703,379
DOUBLE EXPANDED FOOD PRODUCTS
Patricia D. Cummisford, Minneapolis, and Charles I. Beck, Wayzata, Minn., assignors to General Mills, Inc.
No Drawing. Filed July 27, 1970, Ser. No. 58,734
Int. Cl. A23l *1/10, 1/18*
U.S. Cl. 99—81 **8 Claims**

A method is disclosed for preparing a food product such as a snack, a confection or a toast-like food base. The food product is prepared by extrusion expanding a mixture including lipid and flour to provide a food piece having a plurality of large voids surrounded by thick walls. The food piece is then subjected to a secondary expansion such as by deep fat frying, microwave or salt puffing thereby puffing or expanding the walls.

3,703,380
BAKING PROCESS USING POLYOXYETHYLENE FATTY ETHERS AS SOFTENERS AND CONDITIONERS
Roy Kenneth Langhans, Newark, Del., assignor to ICI America Inc.
No Drawing. Filed Aug. 28, 1970, Ser. No. 67,971
Int. Cl. A21d *2/14*
U.S. Cl. 99—91 **6 Claims**

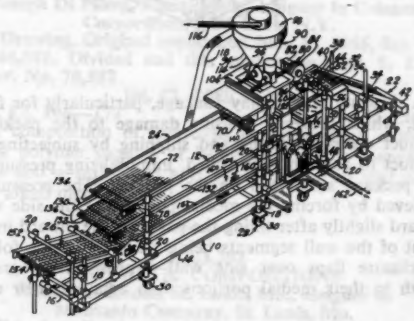
Yeast-raised baked goods such as bread are improved in softness and texture by the addition to the dough mix of polyoxyethylene fatty ethers having the general formula

$$R—CH_2—O—CH_2CH_2—O(CH_2CH_2O)_xCH_2CH_2OH$$

wherein R is an acyclic hydrocarbon radical having 11 to 21 carbon atoms and x is an integer of 2 to 38.

3,703,381
WITHDRAWN

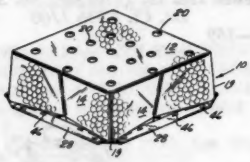
3,703,382
METHOD OF COATING EDIBLE FOOD ARTICLES
Charles N. Harkey, Gainesville, Ga., assignor to J. D. Jewell, Inc., Gainesville, Ga.
Filed Jan. 19, 1970, Ser. No. 3,911
Int. Cl. A23b *1/00*
U.S. Cl. 99—169 **12 Claims**



A method and a machine for continuously applying a combination wet batter and dry breader coating to continuously moving individual pieces of food such as cut-up chicken parts, shrimp, etc. The machine has a batter unit and a breader unit. A batter unit infeed conveyor receives the individual food pieces to be battered and breaded and conveys them continuously through a wet batter bath which coats the individual food pieces with batter. The individual pieces then travel on continuously under a blower to strip off excess batter and smooth the product surface before the continuously traveling product is automatically drop transferred to a breading machine unit top conveyor which receives the product from the batter unit conveyor by a drop-transfer on to a bed of dry breader material created by a breader unit gravity flow hopper and spreader to coat the bottom of the product with dry breader. Next, the continuously traveling product travels under a hopper sifter-type conveyor to coat the top of the product with dry breader. The breader unit has three conveyors comprising stainless steel wire mesh belts running in opposite direction to the preceding conveyor placed under each other. A top conveyor drop transfers to a second (middle) conveyor with proper height spacing to cause the product to turn over (change sides) during the transfer. The same is repeated from the second (middle) conveyor to a third (bottom) conveyor. From the bottom conveyor, the product is dropped and turned onto a stainless steel wire mesh belt carry-out conveyor. The product is carried out and transferred to a packout conveyor while the dry breader falls through the same conveyor and through the wire mesh belt into a continuously traveling sifter then into a hopper. The dry breader is then transferred through vacuum pipe from the receiving hopper at the bottom of the machine back

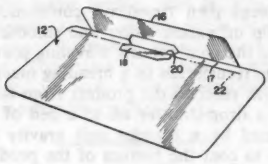
to the starting hopper on the top of the machine which completes a dry breader cycle of the breader recirculating system.

3,703,383
FOOD PRODUCT PACKAGE
Morris William Kuchenbecker, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.
Filed May 17, 1971, Ser. No. 144,086
Int. Cl. B65d *5/00, 81/00*
U.S. Cl. 99—171 7 Claims



A shipping and display package, particularly for fresh fruit, which prevents bruising damage to the packaged product during handling and shipping by subjecting the product to constant, controlled, immobilizing pressure of the package side walls on the product. The pressure is achieved by forcing the medial portions of the side walls inward slightly after filling the package, the inward movement of the wall segments being achieved by the folding of closure flaps over side wall flanges having greater width in their medial portions than adjacent their ends.

3,703,384
EASILY OPENED BACON PACKAGE
Oscar E. Seiferth and Glenn M. Austin, Madison, Wis., assignors to Oscar Mayer & Co., Inc., Madison, Wis.
Filed Mar. 1, 1971, Ser. No. 122,626
Int. Cl. B65b *25/06*
U.S. Cl. 99—174 5 Claims



Sliced bacon, placed on a fold-over bacon board, is hermetically enclosed within a peripheral seal between opposing sheets of packaging film. The fold-over board includes a lower support panel and a flap, joined to the panel along a fold line. The fold line is discontinuous at a recess die-cut from the fold line. The cut-out die-cut board material remains attached to the bacon board and is folded under the board flap to provide an inner restrictive barrier for preventing bacon from reaching the recess area. An easy opening tab is positioned between the opposing films outside the seal area but within the recess region to provide for a smooth, continuous edge of the package. The inner restrictive barrier prevents inadvertent placement of a grease "print" in the seal region due to contacting of bacon with the film in that region. Such a grease print would interfere with the formation of a hermetic seal on manufacture, or with reclosing the package after opening.

3,703,385
FIRE-RESISTANT PRODUCTS AND PROCESS OF MAKING THE SAME
Charles Emile Zwickert, 108 Bis Rue Jean Jaures, Noisy-le-Sec, France
Filed Dec. 23, 1969, Ser. No. 887,674
Claims priority, application France, Sept. 25, 1969, 6932783
Int. Cl. C09k *3/28*
U.S. Cl. 106—15 2 Claims

The invention relates to the fire resistance of solid products which are produced from fluid materials, namely liquid or pasty materials as well as solid materials in divided condition. In order to obtain a product having improved fire resistance properties, said fluid material is mixed with loose ashes. Particulate panels and plastic material are important examples of solid products to which the invention may be applied.

3,703,386
NONFLOW SOLDER-STOP GLASSES COMPRISING LEAD-ZINC BORATE AND CERAMIC
Raymond Louis Dietz, Toledo, Ohio, assignor to Owens-Illinois, Inc.
No Drawing. Filed Oct. 27, 1970, Ser. No. 84,530
Int. Cl. C04b *33/00*; B23k *31/02*
U.S. Cl. 106—39 R 5 Claims

By the addition of the requisite amount of a powdered ceramic to a glass composition adapted for printing upon a selected portion of a conductor within a microelectronic component, the printed glass composition, when fired, is found to form an excellent solder stop (i.e. mask) in that its flow properties at its "firing temperature" are sufficiently retarded for good edge resolution despite multiple refirings that may occur during the formulation of the entire microelectronic component.

3,703,387
METHOD FOR PROCESSING RESISTOR GLASS SEAL COMPOSITIONS EMPLOYING ORGANIC LIQUID
Patrick N. Kesten and Richard A. Webb, Davison, and Raymond E. Bedford, Flint, Mich., assignors to General Motors Corporation, Detroit, Mich.
No Drawing. Filed Mar. 3, 1969, Ser. No. 804,010
Int. Cl. C04b *33/26*
U.S. Cl. 106—46 5 Claims

An improved method for wet mixing a glass seal resistor powder having free boric oxide in the glass phase wherein the exothermic reaction between the water and the boric oxide is minimized and controlled thereby precluding caking and balling of the resistor powder, this being achieved by the addition of an organic liquid solvent selected from the group consisting of toluene, pentane, trichloroethylene, methanol, and ethanol, in the amount of approximately 5–20% by weight of the resistor powder.

3,703,388
HIGH REFRACTIVE INDEX PHOTOCHROMIC GLASSES

Roger J. Araujo, Loris G. Sawchuk, and Thomas P. Seward III, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

No Drawing. Filed Aug. 19, 1970, Ser. No. 65,271
Int. Cl. C03c *3/14, 3/26*
U.S. Cl. 106—47 R 7 Claims

This invention relates to a family of high refractive index photochromic glasses comprised of lanthanum-borates containing silver halides and exhibiting increased photochromic darkenability and efficient optical bleaching.

3,703,389
OPTICAL GLASS HAVING A HIGH REFRACTING INDEX AND A HIGH COLOR DISPERSION

Heinz Brömer, Hermannstein, and Norbert Meinert, Wetzlar, Germany, assignors to Ernst Lietz GmbH, Wetzlar, Germany

No Drawing. Filed Aug. 3, 1970, Ser. No. 60,630
Claims priority, application Germany, Aug. 14, 1969, P 19 41 374.2
Int. Cl. C03c *3/10, 3/30, 3/02*
U.S. Cl. 106—47 Q 4 Claims

An optical glass of which the refractive index ranges between n_e=1.77 and n_e=1.83, and of which the Abbé number ranges between V_e=26 and V_e=23. The glass consists essentially of a glass former of silicon dioxide and germanium dioxide and in addition thereto a relatively high percentage of titanium dioxide is added. Other ingredients present are the oxides of sodium and potassium as well as the oxides of boron and lead. In spite of the high percentage of titanium dioxide the glass is only fairly colored.

3,703,390
CAPACITOR ENCAPSULANT AND METHOD OF FORMING

Roland T. Girard, Scotia, and George A. Rice, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Continuation of abandoned application Ser. No. 811,589, Mar. 28, 1969. This application Apr. 21, 1971, Ser. No. 136,265
Int. Cl. C03c *3/08, 3/04, 5/00*
U.S. Cl. 106—54 2 Claims

A glass encapsulant for thick film capacitors capable of withstanding crazing when thermally cycled between 240° C. and −60° C. is composed of at least 45% by weight refractory metal oxides characterized by melting points above 1700° C. and between 1–4% by weight of high fluxing oxides of metals selected from the group consisting of sodium, potassium, lead and mixtures thereof. Preferably, the refractory metal oxides comprise a mixture of alumina, zirconia and silicon dioxide with alumina and zirconia cumulatively forming at least 25% by weight of the refractory metal oxides.

3,703,391
ELECTRIC MELTING FURNACE AND PROCESS OF USING IT

Thomas A. Clishem, Valley Station, Francis R. Duerr, Devondale, and Frederick D. Olympia, Jefferson County, Ky., assignors to Corhart Refractories Company, Louisville, Ky.

Filed July 29, 1970, Ser. No. 58,901
Int. Cl. C04b *35/48*
U.S. Cl. 106—57 5 Claims

Furnace has carbon electrodes suspended in a refractory-lined melting pot with a tap hole in the middle of a front wall portion thereof. A water-cooled copper lance sealably and removably engages the tap hole for injecting reactive gas into a molten charge in the pot. The lance has a tapered portion for sealably engaging the walls of the tap hole and has a stubby end as the only part thereof protruding inside of and facing into the pot. The stubby end has a plurality of jet orifices for discharging reactive gas, which orifices have axes disposed at an acute downward angle from the horizontal and in a divergent fan-like pattern in the direction of gas flow in the lance. Furnace is operated to produce molten oxidic refractory material by providing a shallow pool of that molten material in the pot, electrically melting further oxidic refractory material by means of the electrodes to enlarge the pool, engaging the water-cooled lance in the tap hole and causing reactive gas, e.g. oxygen, to flow from the lance into the pot, tilting the furnace forward to cause the pool surface to rise above the tap hole and to effect injection of gas into the pool with stirring thereof, then back-tilting the furnace after a predetermined time of lancing, discontinuing flow of the gas and removing the lance from the tap hole in preparation for fusion-casting the pool.

3,703,392
SHAPED ARTICLES OF IMPROVED DYEABILITY

Joseph Di Pietro, Alma, Mich., assignor to Celanese Corporation, New York, N.Y.

No Drawing. Original application June 30, 1965, Ser. No. 468,581. Divided and this application Sept. 8, 1970, Ser. No. 70,552
Int. Cl. C08b *21/04*
U.S. Cl. 106—177 6 Claims

A composition of improved dye receptivity comprising a polymer capable of being formed into shaped articles and a sulfonated aryl phosphate or an aryl phospate alkali metal sulfonate.

3,703,393
ASPHALTIC COMPOSITIONS

Russell E. Koons, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 711,188, Mar. 7, 1968, which is a continuation-in-part of application Ser. No. 321,360, Nov. 4, 1963. This application Sept. 2, 1970, Ser. No. 69,119
Int. Cl. C08h *13/00, 17/22;* C08j *1/46*
U.S. Cl. 106—279 10 Claims

The softening point and penetration of an air-blown asphalt is increased by mixing the air-blown asphalt with a liquid polyolefin oil having an average molecular weight of 500 to 2,000. The novel compositions can be utilized for various applications such as calking compounds.

ERRATUM

For Class 117—138.8 E see:
Patent No. 3,703,197

3,703,394
FORM BOARD COATED WITH A POROUS POLYMER FILM AND A FORM OIL, SAID FILM CHARACTERIZED BY HAVING SOLID PARTICLES DISTRIBUTED THERETHROUGH

Charles B. Hemming, Brewster, N.Y., and Edward L. Bernholz, Danbury, Conn., assignors to Champion International Corporation, New York, N.Y.

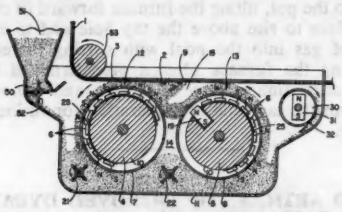
No Drawing. Continuation-in-part of application Ser. No. 505,060, Oct. 24, 1965. This application Sept. 19, 1969, Ser. No. 861,546
Int. Cl. B44d *1/20;* B29c *1/04*
U.S. Cl. 117—5.1 13 Claims

The present invention is concerned with a reusable form board of any material, such as wood, plywood, hardboard, cement-asbestos or other fibrous board, and a porous polymer coating, with or without solid materials, preferably microspheres, used with an oil coating applied to the board either before or after the plastic coating, or as a blend of the plastic coating and oil.

3,703,395
METHOD FOR DEVELOPMENT OF ELECTROSTATIC IMAGES

Roger A. Drexler and Conrad Altmann, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Original application Feb. 29, 1968, Ser. No. 709,281, now Patent No. 3,543,720, dated Dec. 1, 1970. Divided and this application July 20, 1970, Ser. No. 63,961
Int. Cl. G03g 13/08, 15/08
U.S. Cl. 117—17.5 1 Claim



Developer is fed into a cavity faster than it is discharged creating a developer accumulation in the cavity forming a soft, agitated development medium. In preferred embodiments, two magnetic brushes are arranged to create the accumulation in the form of a gently tumbling rollback from the contacting of one of the brushes with the image-bearing surface. In the preferred embodiments, the accumulation is accentuated by adjusting the spacing between the brushes and the image-bearing surface, adjusting the peripheral speed of the brushes and controlling the direction of movement of the image-bearing surface relative to the movement of the brushes.

Carrier carryout is reduced by directing a strong magnetic flux at the rollback area and by providing an auxiliary carrier scavenging mechanism.

3,703,396
APPARATUS FOR MANUFACTURING PRODUCTS COMPOSED OF FIBERS AGGLOMERATED WITH SYNTHETIC RESINS

Jean Lamanche, La Ravoire, and Gerard Buisson, Chambery, France, assignors to Compagnie de Saint-Gobain, Neuilly-sur-Seine, Seine, France

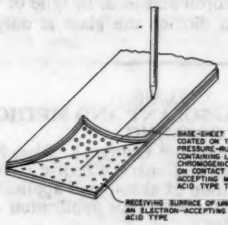
Filed Feb. 2, 1970, Ser. No. 7,639
Claims priority, application France, Feb. 5, 1969, 6902522
Int. Cl. B44d 1/094; B32b 5/16
U.S. Cl. 117—21 4 Claims

The production of running lengths of hardened compounds of fibers thoroughly impregnated with synthetic resin, which may be cut into small fragmentary pieces adapted to serve as a charge for molding plastic bodies with a fiber reenforcement. The strands of the fibers are reeled from a supply, and the individual fibers are separated from each other by air currents or electrostatic charges of the same polarity. Synthetic resin in powdered form is applied to the separated fibers to effect a thorough intermingling between them which is followed immediately by a preliminary heating of the composite product to effect a fusing of the resin with the fiber component. This fusing is followed by a more intense heating and shaping of the composite product into continuous reeds, which, after cooling and hardening may be cut up into small pieces of any desired size. A special feature of the invention resides in separating the fibers of the strands from one another by applying an electrostatic potential of the same polarity to the fibers to produce a repulsive force therebetween, and by applying an electrostatic potential of opposite polarity to the powdered particles of the resin, to induce an attractive force between these particles and the fibers, and the ultimate thorough fixation of these particles onto the fibers, in consequence of the heating and molding thereof by their passage through the openings in heated spinnerets or analogous heating and shaping devices.

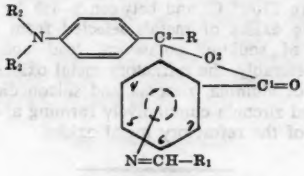
3,703,397
MARK-FORMING RECORD MATERIALS AND PROCESS FOR THEIR USE

Chao-Han Lin, Dayton, and Arthur J. Wright, Cincinnati, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Original application Jan. 21, 1969, Ser. No. 792,280, now Patent No. 3,594,369, dated July 20, 1971. Divided and this application Oct. 30, 1970, Ser. No. 85,754
Int. Cl. B61m 5/22
U.S. Cl. 117—36.2 15 Claims


BASE-SHEET OF RECORD MATERIAL COATED ON THE REAR WITH MINUTE PRESSURE-RUPTURABLE CAPSULES CONTAINING LIQUID SOLUTION OF CHROMOGENIC MATERIAL DEVELOPABLE ON CONTACT WITH AN ELECTRON-ACCEPTING MATERIAL OF THE LEWIS-ACID TYPE TO COLORED FORM
RECEIVING SURFACE OF UNDERSHEET COATED WITH AN ELECTRON-ACCEPTING MATERIAL OF THE LEWIS-ACID TYPE

A novel chromogenic material of normally colorless form is disclosed, having a structural formula:



wherein R comprises 1,2-dimethylindol-3-yl and p-dialkylaminophenyl radicals; R_1 comprises substituted and unsubstituted aromatic and heterocyclic-aromatic radicals; and R_2 comprises hydrogen and alkyl radicals having less than five carbon atoms—said material assuming a colored form upon reactive contact with a Lewis acid molecule. Examples include 6-(p-dimethylaminobenzylidene)amino-3-(p-dimethylaminophenyl)-3-(1,2 - dimethylindol-3-yl)phthalide; 5 - (p-dimethylaminobenzylidene) amino-3-(p-dimethylaminophenyl)-3-(1,2 - dimethylindol-3-yl)phthalide; 6-(benzylidene)amino-3,3-bis(p-dimethylaminophenyl)phthalide; 5-(p-dimethylaminobenzylidene) amino-3,3-bis(p-dimethylaminophenyl)phthalide; 6-(cinnamylidene)amino-3-(p-dimethylaminophenyl - 3 - (1,2-dimethylindol-3-yl)phthalide.

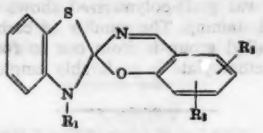
3,703,398

PRESSURE SENSITIVE COPYING PAPER

Hisatake Ono and Chiaki Osada, Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed Oct. 8, 1970, Ser. No. 79,336
Claims priority, application Japan, Oct. 8, 1969, 44/80,537
Int. Cl. B41m 5/22
U.S. Cl. 117—36.2 6 Claims

Pressure-sensitive copying paper and process for preparing same comprising a support having coated thereon a layer of a color-forming compound having the formula



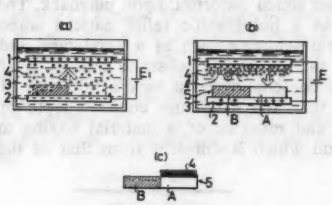
wherein R_1 is an alkyl group having 1 to 4 carbon atoms, R_2 and R_3 each is a member selected from the group consisting of a hydrogen atom, a halogen atom, a nitro group, an alkoxyl group of from 1 to 4 carbon atoms, an alkoxycarbonyl group of from 1 to 4 carbon atoms, and an aldehyde group, said compound reactive with an electron acceptive substance to produce a distinct color. The present invention also extends to the color-forming compounds employed and their process of preparation.

3,703,399

METHOD OF LIQUID REVERSAL DEVELOPMENT FOR ELECTROGRAPHY

Susumu Tanaka and Ken-Ichi Wada, Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Minami-ku, Japan

Filed Oct. 14, 1970, Ser. No. 80,614
Claims priority, application Japan, Oct. 29, 1969, 44/86,577
Int. Cl. G03g 13/10, 15/10
U.S. Cl. 117—37 LE 5 Claims



A bias voltage having an opposite polarity relative to toner is first applied to a developer liquid to thereby cause the toner to move toward a development electrode, and a bias voltage having the same polarity as the toner is then applied to the developer liquid. This method insures improved reproductivity of contrast and halftone of images on electrographic paper.

3,703,400

DEVELOPING METHOD FOR ELECTRO-PHOTOGRAPHY

Yasuo Tamai, Masamichi Sato, Seiji Matsumoto, and Satoru Honjo, Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed Apr. 7, 1970, Ser. No. 26,442
Claims priority, application Japan, Apr. 7, 1969, 44/26,263
Int. Cl. B41c 1/06; G03g 9/04
U.S. Cl. 117—37 LE 1 Claim

A developing method for electrophotography comprising the steps of developing an electrostatic latent image on a photoconductive insulating layer with a liquid developing agent containing therein fine particles having a positive electrical charge and subsequently cleaning said insulative layer carrying the image thereon, the improvement which comprises said liquid developing agent being comprised of a carrier liquid, fine particles having a positive electric charge contained in said carrier liquid in the dispersed state, and a resin contained in said carrier liquid in the dissolved state

(I) said carrier liquid having an electric resistance exceeding 10^{11} Ω cm. and being insoluble in ethyl cellulose,
(II) said fine particles which are contained in the dispersed state being composed of (a) pigment particles insoluble in the carrier liquid and (b) ethyl cellulose particles, and
(III) at least a part of the resin which is contained in the dissolved state in the said liquid being insoluble in a cleaning liquid used in said cleaning.

3,703,401

METHOD FOR PREPARING THE VIEWING-SCREEN STRUCTURE OF A CATHODE-RAY TUBE

Samuel Broughton Deal, Lancaster, and Donald Walter Bartch, Columbia, Pa., assignors to RCA Corporation

No Drawing. Filed Dec. 28, 1970, Ser. No. 102,148
Int. Cl. H01j 3/06; B44d 5/00
U.S. Cl. 117—33.5 CP 9 Claims

Method comprises (a) preheating to about 50 to 75° C. a viewing-screen support, a viewing screen thereon and a light-reflective metal layer on the screen, (b) depositing on the preheated metal layer a coating of an organic, volatilizable film-forming material from an aqueous dispersion thereof, and (c) depositing on the coated preheated metal layer an overcoating of carbon particles from a binder-free suspension of carbon particles in a liquid. Then, the support and structures thereon are baked in air at about 400 to 450° C. to remove organic and volatile matter.

3,703,402

ELECTRON SENSITIVE COMPOSITIONS

Herbert S. Cole, Jr., Scotia, N.Y., assignor to General Electric Company

No Drawing. Filed Nov. 23, 1970, Ser. No. 92,307
Int. Cl. C01j 1/10; B44d 1/50
U.S. Cl. 117—37 R 10 Claims

Certain unsaturated partial esters of maleic anhydride copolymers with certain mono-vinylidene compounds are insensitive to actinic light but extremely sensitive to electrons. Thin coatings of these compositions are insolubilized with a radiation dose no greater than 5×10^{-7} coul./cm.^{2}, which is a marked improvement over the materials now used as the electron-sensitive resist for making high resolution photomasks, microcircuits, etc.

3,703,403

METHOD FOR MANUFACTURING SHEET MATERIAL EXHIBITING A HIGHLY GLOSSY SURFACE

Shigekazu Ohnishi, Masaharu Nishishita, and Hisateru Takimoto, Okayama, Japan, assignors to Kuraray Co., Ltd., Kurashiki City, Japan

No Drawing. Filed Sept. 14, 1970, Ser. No. 72,142
Claims priority, application Japan, Sept. 29, 1969, 44/77,555
Int. Cl. B44d 1/44
U.S. Cl. 117—64 C 13 Claims

A method is provided for producing sheet material exhibiting a high glossy surface comprising applying a layer of a polymer solution to a highly smooth-surfaced substrate, superimposing a porous sheet onto said layer of polymer solution, removing solvent from said layer of

polymer solution through the porous sheet, thereby solidifying the polymer solution to form a non-porous polymeric layer to which said porous sheet is bonded, heat-setting the non-porous polymeric layer by heating said layer at a temperature ranging from about 10° C. to 50° C. below the melting point of the polymer, cooling the non-porous polymeric layer; and then stripping the non-porous polymeric layer to which the porous sheet is bonded from said smooth-surfaced substrate to recover a sheet material exhibiting a highly glossy surface.

3,703,404

COATED SEEDS AND PROCESS FOR COATING SEEDS

William W. Kirk, Salinas, Calif., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Oct. 30, 1970, Ser. No. 85,757
Int. Cl. A01c *1/06*
U.S. Cl. 117—72 41 Claims

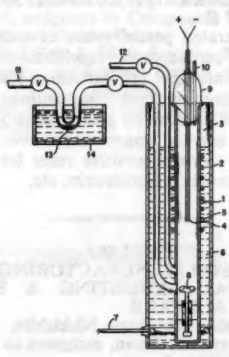
A new process for coating seeds for planting is described. Seeds are initially coated with finely-ground, porous particles, e.g., heat expanded vermiculite, dampening them only enough to cause the vermiculite particles to adhere to the natural seed coat and to each other. When the seed is completely coated an overcoat is applied. The overcoat comprises finely-ground porous particles applied with a bonding agent comprising about equal parts polyvinyl acetate and polyvinyl alcohol with enough water to make the agent sprayable. Small seeds so coated germinate substantially as quickly as uncoated seeds and total germination is comparable. Small seeded vegetable crops can be planted to a stand with available precision planters.

3,703,405

VAPOR DEPOSITION OF RHENIUM AND RHENIUM-TUNGSTEN ALLOY COATINGS

Abner Brenner, Chevy Chase, Md., and Harvey J. Anderson, Washington, D.C., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Oct. 27, 1970, Ser. No. 84,292
Int. Cl. C23c *11/00, 13/00;* B23p *3/00*
U.S. Cl. 117—107.2 1 Claim



A process for coating a substrate with rhenium. A mixture of gaseous hydrogen and a rhenium oxychloride vaporized in an inert gas is passed over the substrate, which is heated to a temperature effecting reduction of the oxychloride and deposition of rhenium metal on the substrate. A rhenium-tungsten alloy coating can be deposited by incorporating tungsten hexafluoride in the gas mixture passed over the substrate.

3,703,406

PROCESS FOR MANUFACTURING A DURABLE OILY STAIN RESISTANT POLYESTER FIBER, AND ITS PRODUCT

Ichiro Sakurada, Kyoto, Toshio Okada, Kadoma, and Motoaki Uragami, Osaka, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

No Drawing. Filed Sept. 10, 1970, Ser. No. 71,200
Claims priority, application Japan, Sept. 10, 1969, 44/71,257
Int. Cl. B44d *5/12*
U.S. Cl. 117—118 3 Claims

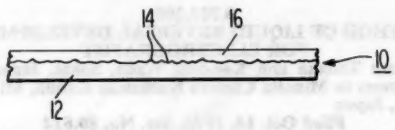
A polyester fiber onto which a lower-hydroxyalkyl methacrylate was graft-polymerized shows excellent resistance to oil staining. The number of carbon atoms of said hydroxyalkyl group is from one to four and 2-hydroxyethyl methacrylate is preferably employed.

3,703,407

RELIEF PHASE HOLOGRAMS

William James Hannan and John Patrick Russell, Pennington, and Arthur Herbert Firester, Skillman, N.J., assignors to RCA Corporation

Filed Dec. 15, 1970, Ser. No. 98,302
Int. Cl. G02b *27/22;* G03c *5/22*
U.S. Cl. 117—138.8 UA 4 Claims



An improved relief phase hologram is described which minimizes signal distortion upon playback. The hologram comprises a holographic relief pattern embossed on a polymeric substrate such as a vinyl tape and a coating on the surface of the substrate directly over the relief pattern. The coating must have a thickness of somewhat greater than the maximum contour depth of the relief pattern and must be of a material having an index of refraction which is different from that of the substrate.

3,703,408

PHOTOSENSITIVE SEMICONDUCTOR DEVICE

Melvin Belasco, Dallas, and Sebastian R. Borrello, Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Original application July 5, 1967, Ser. No. 652,653. Divided and this application May 21, 1969, Ser. No. 871,116
Int. Cl. B44l *1/18*
U.S. Cl. 117—212 13 Claims

A metal-semiconductor-metal phototransistor formed by a pair of closely spaced, thin metal films in rectifying contact with the surface of a lightly doped p-type indium arsenide substrate. The spacing between the metal films is substantially less than the diffusion length of minority carrier in the indium arsenide at the operating temperature, which is on the order of —78° C. One metal film may be considered the collector region, the semiconductor material the base region, and the other metal film the emitter region. When the transistor is biased like an NPN transistor, the collector current is varied in proportion to the radiation striking the base region generally in the

same manner as a photodiode, but the current modulation is many times that produced by a photodiode for a given radiation level.

3,703,409
AMINOBENZOIC ACID SULFATES AS INTUMESCENT AGENTS
Shirley H. Roth, Highland Park, N.J., assignor to Cities Service Company, New York, N.Y.
No Drawing. Filed Dec. 28, 1970, Ser. No. 102,241
Int. Cl. C09d *5/18*; C09k *3/28*
U.S. Cl. 117—136 2 Claims

Aminobenzoic acid sulfates, such as 2-amino-5-chloro benzoic acid sulfate, are used as intumescent agents dispersed in a binder and coated on a substrate.

3,703,410
5-AMINO-2-NITROBENZOIC ACID AS AN INTUMESCENT AGENT
Shirley H. Roth, Highland Park, N.J., assignor to Cities Service Company, New York, N.Y.
No Drawing. Filed Dec. 28, 1970, Ser. No. 102,242
Int. Cl. C09d *5/18*; C09k *3/28*
U.S. Cl. 117—136 3 Claims

5-amino-2-nitrobenzoic acid is useful as an intumescent agent with a binder.

3,703,411
METHOD OF MAKING A MAGNETIC RECORDING MEDIUM
Cevdet Melezoglu, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
No Drawing. Filed Apr. 22, 1968, Ser. No. 723,319
Int. Cl. H01f *10/02, 10/04*
U.S. Cl. 117—237 2 Claims

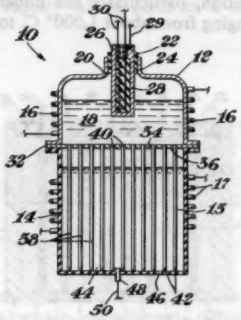
A method of making a magnetic recording medium or media comprising the steps of providing a substrate or support member of a vitreous material such as a glass or glass-ceramic in the form of a tape, disk or cylinder, heating such support member, spraying a surface of the heated member with a solution of ferric chloride to form thereon a coating or film of ferric oxide having magnetic properties. If only alpha ferric oxide is formed on said surface the support member may be subjected to a reducing atmosphere at elevated temperatures to change the coating to magnetite. It is preferable to thereafter subject said support member to an oxidizing atmosphere at elevated temperatures to change said coating to gamma ferric oxide.

ERRATUM

For Class 117—138.8 B see:
Patent No. 3,703,588

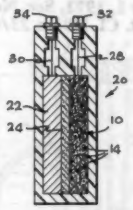
3,703,412
PROCESS FOR GENERATING ELECTRICAL ENERGY COMPRISING MELTING THE ANODE METAL IN THE RESERVOIR PRIOR TO MELTING THE ANODE METAL IN THE ELECTROLYTE FIBERS
Charles A. Levine, Concord, Calif., assignor to The Dow Chemical Company, Midland, Mich.
Filed Sept. 8, 1970, Ser. No. 70,145
Int. Cl. H01m *33/00*
U.S. Cl. 136—6 2 Claims

The disclosure relates to battery cells having a liquid reducible cathode and an oxidizable metal anode contained within a reservoir and a plurality of hollow electrolyte fibers. An improved cell is taught wherein heating means is positioned in thermal communication with the reservoir of oxidizable metal. Supporting means for the fibers is also described, which means increased battery life. Also disclosed is a process whereby the battery is



activated by melting the oxidizable metal disposed in the reservoir before the metal in the fibers is melted.

3,703,413
FLEXIBLE INORGANIC FIBERS AND BATTERY ELECTRODE CONTAINING SAME
Frank C. Arrance, Costa Mesa, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.
Filed Dec. 11, 1969, Ser. No. 884,191
Int. Cl. H01m *35/00, 13/00*
U.S. Cl. 136—6 23 Claims

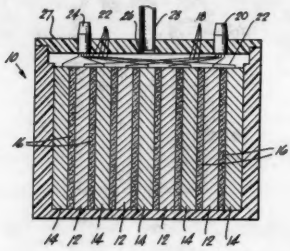


Method of producing strong inorganic fibers such as zinc oxide fibers, by forming a mixture of inorganic particles such as zinc oxide, with a plastic binder such as polyphenylene oxide (PPO), in a flash drying solvent for the binder, such as chloroform, forming a slurry, and fiberizing the mixture as by spraying into a closed chamber, to flash the solvent and form fibers of the inorganic material containing plastic binder, such as zinc oxide fibers containing polyphenylene oxide; such coated fibers can be sintered, e.g. at temperature of the order of about 1000° C., if desired, to remove the organic binder or residue, and form strong sintered fibers. The resulting inorganic fibers, either unsintered or sintered, are particularly adapted to be incorporated into battery electrodes, e.g. by compacting zinc oxide unsintered or sintered fibers into an electrode shape, to provide a high strength porous, stable electrode structure.

3,703,414
LOW-GASSING BATTERY SEPARATOR AND METHOD OF PRODUCTION
Joseph S. Smatko, Santa Barbara, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.
Filed Sept. 8, 1970, Ser. No. 70,400
Int. Cl. H01m *43/02*
U.S. Cl. 136—30 26 Claims

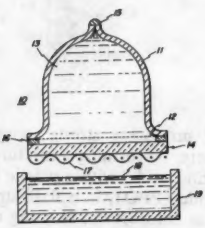
Production of inorganic porous sintered battery separator substantially reducing formation of gas when in contact with a zinc electrode, and permitting long cycle life

of a high energy density battery such as a silver-zinc battery, produced according to a preferred embodiment by firing or sintering a compacted magnesium silicate-iron silicate composition, particularly the mineral olivine, at temperature ranging from about 1,000° C. to about 1,400°



C. in a carbon monoxide-carbon dioxide atmosphere, to produce a porous sintered membrane consisting essentially of magnesium silicate and iron silicate, e.g., a sintered porous olivine separator, the iron content thereof being substantially entirely in ferrous form.

3,703,415
PRIMARY SODIUM-WATER BATTERY
Stephan P. Mitoff, Elnora, and Fritz G. Will, Scotia, N.Y., assignors to General Electric Company
Filed June 1, 1971, Ser. No. 148,791
Int. Cl. H01m *23/00*
U.S. Cl. 136—83 R **5 Claims**

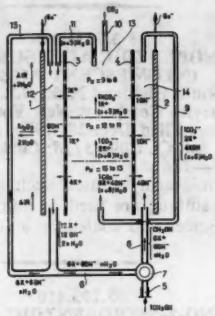


A primary sodium-water battery is disclosed which comprises a casing with an open surface, an anode positioned in the casing, an anode of sodium as an amalgam or sodium in a nonaqueous organic electrolyte, a solid sodium ion-conductive electrolyte sealed to the casing closing the open surface, and a metallic grid positioned adjacent the exterior surface of the solid electrolyte.

3,703,416
BASIC CELL OPERATING WITH HYDROCARBON FUEL
Jean Jacquelin, Lapoitevine, France, assignor to Compagnie Generale d'Electricite, Paris, France
Filed Sept. 29, 1970, Ser. No. 76,511
Claims priority, application France, Sept. 29, 1969, 6933153
Int. Cl. H01m *27/00*
U.S. Cl. 136—86 R **3 Claims**

Basic cell with hydrocarbon fuel, in which a decarbonization of the electrolyte is carried out.

It comprises two diaphragms respectively anodic and cathodic which insulate a central compartment wherein there locally appears a pH value sufficiently low to give rise to a carbon dioxide emission.

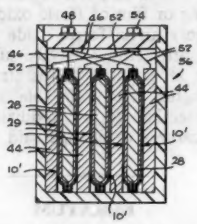


The invention may be used for fuel cells having a high overall energetic yield.

ERRATUM

For Class 136—134 R see:
Patent No. 3,703,589

3,703,417
HEAT SEALED FLEXIBLE ENVELOPE SEPARATOR AND BATTERY EMBODYING SAME
Albert G. Rosa, Placentia, and George W. Birrer, Westminster, Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.
Filed Sept. 11, 1969, Ser. No. 857,148
Int. Cl. H01m *3/00*
U.S. Cl. 136—145 **16 Claims**



Production of flexible envelope formed of flexible sheets heat sealed together along edge portions thereof, said flexible envelope having high resistance to alkali attack at elevated temperature over an extended period, the heat sealed bond being resistant to delamination of the bonded sheets and providing a strong bond, by heat sealing such flexible sheets, e.g. formed of a chrysotile asbestos (pure fuel cell grade), employing a sealant in the form preferably of a mixture of neoprene and polysulfone. The resulting flexible envelope can be coated with a flexible substantially inorganic film by dip-coating in a mixture preferably of a major portion of an inorganic or ceramic separator material, a minor portion of potassium titanate in short fiber form, and a minor portion of inorganic polymer, e.g. polyphenylene oxide, dissolved in a suitable solvent such as chloroform. The resulting porous chrysotile asbestos separator envelope heat sealed as described above and having a flexible coating thereon as

described above, can serve as an electrode compartment for a battery electrode, e.g. a zinc electrode inserted therein, and such separator-electrode unit incorporated in a battery in side-by-side relation with other electrodes, such as silver electrodes, the flexible electrode compartment being resistant to shorting by penetration of electrode material into the sealed edge portions of the separator envelope.

3,703,418
METHOD OF PREVENTING RUST ON STEEL SURFACE

Hiroshi Iijima, Masaji Terasawa, Yutaro Gotoh, and Osamu Tokita, all % Nippon Kokan Kabushiki Kaisha Technical Institute 2730, Kawasakishi, Japan

No Drawing. Continuation-in-part of application Ser. No. 683,028, Nov. 14, 1967. This application Dec. 31, 1970, Ser. No. 103,339
Claims priority, application Japan, Nov. 16, 1966, 41/74,959
Int. Cl. C23f 7/00
U.S. Cl. 148—6.14 **3 Claims**

Metals are protected against rust formation thereon by immersing them in a molybdate solution.

3,703,419
SURFACE FINISHING

Donald F. Esler, Natrona Heights, and Edward G. Choby, Jr., Pittsburgh, Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

No Drawing. Filed Sept. 1, 1970, Ser. No. 68,789
Int. Cl. C23f 7/00
U.S. Cl. 148—6.16 **29 Claims**

A composition for providing a metallic surface with protection against marring, marking, and staining which comprises an aqueous solution having a molar concentration of phosphate, chromate, magnesium, and ammonium ions of from 0.01 to 1.00 mole per 100 ml. of water and a molar concentration of silicate ions of from 0.01 to 33% of the molar concentration of phosphate, chromate, magnesium, and ammonium ions. The phosphate, chromate, magnesium, and ammonium ions are proportionately present in the aqueous solution as 27–73 mole percent phosphate ion, 5–39 mole percent chromate ion, 0–23 mole percent magnesium ion, and 0.5–35 mole percent ammonium ion.

A method of providing a metallic surface with a coating for protecting the metallic surface against marring, marking, and staining which comprises the steps of coating the surface with the composition of this invention and curing the coating so as to render it substantially water insoluble.

A composite article comprising a layer of metal and at least one layer of a substantially water insoluble, transparent, cured coating which offers protection from marring, marking, and staining. The coating is comprised of anionic polymeric chains of phosphorus, chromium, oxygen, and silicon atoms with or without magnesium cations.

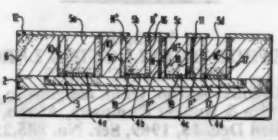
3,703,420
LATERAL TRANSISTOR STRUCTURE AND PROCESS FOR FORMING THE SAME

Madhukar B. Vora, Beacon, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 3, 1970, Ser. No. 16,103
Int. Cl. H01l 7/36, 5/00; C23c 13/00
U.S. Cl. 148—175 **13 Claims**

A novel transistor wherein current travels laterally along the semi-conductor surface having polycrystalline diffusion paths in its surface which serve as the means of introducing impurities in a vertical orientation into surrounding single crystal material because of the more rapid diffusion rate of polycrystalline material. Appropriate collector/emitter and base contacts are made thereto.

Process for forming such a lateral semi-conductor by diffusing through a polycrystalline diffusion path or channel, diffusion rapidly taking place in a lateral direction

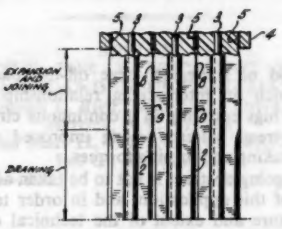


through the polycrystalline silicon which is in an epitaxial layer. In an alternate embodiment, diffusion is through monocrystalline areas to an ultra highly doped substrate area.

3,703,421
PLASTIC COATED WIRES AND PREPARATION THEREOF

Richard W. Fisher, 6 Fairway Court, Scotch Plains, N.J.

Continuation-in-part of application Ser. No. 724,472, Apr. 26, 1968. This application Sept. 29, 1970, Ser. No. 76,580
Int. Cl. B29f 3/10
U.S. Cl. 156—244 **5 Claims**



Plastic coated wires, useful as twist ties for fastening packages and parts and as bag closures are provided in multiple ribbons, each ribbon integral with its adjacent ribbons and detachably attached thereto. The ribbons are prepared by extruding a plurality of thermoplastic ribbons individually, allowing them to expand, join, and seal outside the extrusion die and drawing down the extrudate to the desired cross-sectional configuration.

3,703,422
POLYAROMATIC RESIN FACED HONEYCOMB PANEL AND METHOD FOR MAKING SAME

Stanley Y. Yoshino, Monterey Park, Calif., assignor to North American Rockwell Corporation

Filed Jan. 2, 1970, Ser. No. 334
Int. Cl. B32b 31/02, 31/26
U.S. Cl. 156—87 **10 Claims**

A honeycomb panel with non-flammable face sheets made of glass cloth impregnated with a polyaromatic resin such as polyimide is disclosed. A vacuum bag layup arrangement having stacked in order on a platen a Teflon cloth, a face sheet, a bonding agent made of a thin film of epoxy type resin, a honeycomb core, another film of bonding agent, another face sheet, and another Teflon cloth. A bleeder fabric made of glass cloth is provided

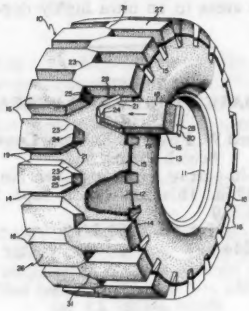
to make contact with the Teflon cloth and the evacuation connection for the vacuum bag. The bag has its edges sealed to the platen and then evacuated. While a vacuum is maintained within the bag the epoxy is heat-cured and then the polyimide is heat-cured.

3,703,423

METHOD OF RELUGGING LARGE PNEUMATIC TIRES

Merritt W. Wolfe, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 15, 1969, Ser. No. 885,254
Int. Cl. B29h *17/36;* B60c *11/00*
U.S. Cl. 156—96 10 Claims



A method of relugging large off-the-road pneumatic tires in which an interlocking relationship is provided among the lugs resulting in a continuous circumferential rib and a tread pattern having improved resistance to driving, breaking and turning torques.

The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full nature and extent of the technical disclosure of this application, reference must be made to the accompanying drawings and the following detailed description.

3,703,424

METHOD OF PRODUCING A WEAR-RESISTANT AREA IN A SURFACE-COVERING MATERIAL

Harry Charnock, Westhoughton, and David E. Bowker, Atherton, England, assignors to Dunlop Holdings Limited

Filed July 23, 1969, Ser. No. 843,964
Claims priority, application Great Britain, July 30, 1968, 36,323/68
Int. Cl. C09j *5/00*
U.S. Cl. 156—272 7 Claims

A wear-resistant area is produced in a surface-covering material, e.g. a car carpet, having a pile of thermoplastic flock fibres by subjecting the pile to heat and pressure in an area corresponding to the desired wear-resistant area to fuse the fibres in that area and cooling to set the fused material.

3,703,425

METHOD OF MAKING TRANSPARENT LAMINATED STRUCTURE HAVING TRANSPARENT INTERLAYER

John Delmonte, Glendale, Paul L. Meadows, Lakeview Terrace, and Augusto E. Benavides, Mission Hills, Calif., assignors to Furane Plastics Incorporated, Los Angeles, Calif.

Filed Apr. 29, 1969, Ser. No. 820,116
Int. Cl. B29c *19/00*
U.S. Cl. 156—245 15 Claims

Laminated sheets of glass or rigid transparent synthetic plastic sheets for "safety glass" purposes are made by casting the interlayer between the rigid sheets, using certain liquid polyurethane prepolymers, curable at low temperatures. The specific polyurethanes for this purpose have high elastic properties and strong adhesion to the surfaces of the glass or other transparent sheets, which reduces the hazards of flying pieces when the laminate is broken by impact. The casting process has advantages in permitting the simultaneous making of margin gaskets and seals, and the embedment of mechanical or decorative parts.

3,703,426

METHOD OF MAKING POLYESTER LAMINATES

William M. Larson, Hudson, and William E. Jackson, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation of abandoned application Ser. No. 662,320, Aug. 22, 1967. This application Nov. 18, 1970, Ser. No. 90,775
Int. Cl. B32b *27/40;* C09j *5/02*
U.S. Cl. 156—308 6 Claims

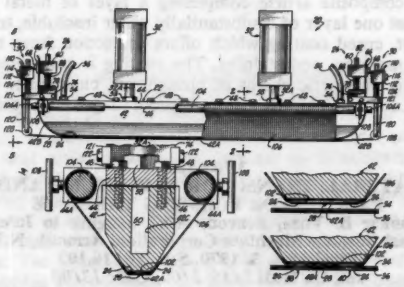
This invention relates to a method of making improved polyester laminates by washing the surface of the polyester with solvent solution of an organic polyisocyanate and then adding an isocyanate type adhesive to the surface and bringing the polyester composition containing the adhesive into contact with the materials to be laminated, either another polyester or a metal, and allowing the adhesive to set and cure.

3,703,427

THERMAL IMPULSE SEALING BAR ASSEMBLY

John C. Sellers, 507 Signal Hill Road, Barrington, Ill. 60010, and John W. Schneiter, 1217 E. Fremont, Arlington Heights, Ill. 60004

Filed June 1, 1971, Ser. No. 148,495
Int. Cl. B30b *15/34;* G05d *23/00*
U.S. Cl. 156—359 13 Claims



The disclosed thermal impulse sealing bar assembly includes an elongated thermally conductive bar defining a hollow chamber through which a cooling fluid is circulated. A flat lower surface of the bar faces the sheet or web material to be sealed, and the ends of the bar have

curved or arcuate surfaces merging with the flat lower surface. A pair of flat resistance heating elements are mounted in spaced and parallel positions on the flat surface and include terminal portions at their opposite ends passing over the curved guide surfaces to be clamped in terminal blocks slidably mounted on the bar. The terminal blocks are biased for movement in a direction generally perpendicular to the flat sealing surface to hold the resistance heating elements against the guide and flat surfaces, thereby avoiding any interference between the material to be sealed and the terminal blocks. A layer of low resistivity, electrically conductive material on the terminal portions of the elements limits heating thereof to the part actually pressed against the material to be sealed so as to avoid the formation of "hot spots." A resistance cutting wire is disposed between the heating elements used for sealing.

3,703,428

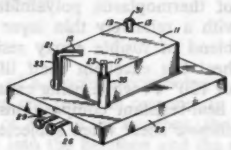
APPARATUS FOR RESETTING THE CORNER OF DEEP-DRAWN LAMINATED ARTICLES

Ezra C. Polling, Webster, and Charles E. Botsford, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Original application May 2, 1968, Ser. No. 726,114. Divided and this application Oct. 2, 1970, Ser. No. 77,732

Int. Cl. B32b *35/00*

U.S. Cl. 156—382 **1 Claim**



A sheet of metal having a skin of plastic bonded thereto is deep drawn to form a box having an external plastic skin. Then laminating bonds are reset where delamination has occurred, usually at the corners, by heating locally from the inside of the box while concurrently applying pressure to the skin.

Apparatus for performing this method comprises a core having induction heating coils at the corners, over which the box fits, and a concave boot which fits over the box and has a fluid pressure actuated bladder to press against the corners of the box during the heating step.

An automatic control system provides for repetitive operation in a production line wherein a series of boxes are connected by a web and treated one after the other.

3,703,429

APPARATUS FOR MAKING FILTER MEANS

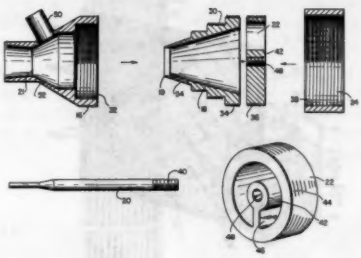
Richard M. Berger, Richmond, and Elwin W. Brooks, Mechanicsville, Va., assignors to American Filtrona Corporation, Richmond, Va.

Division of application Ser. No. 45,109, June 10, 1970, now Patent No. 3,637,447, which is a continuation-in-part of applications Ser. No. 727,477, May 8, 1968, now Patent No. 3,533,416, and Ser. No. 820,355, Apr. 30, 1969, now Patent No. 3,599,646. Said Ser. No. 820,355 being a continuation-in-part of said application Ser. No. 727,477. This application June 23, 1971, Ser. No. 155,705

Int. Cl. D04h *1/44*; B65h *5/22*

U.S. Cl. 156—441 **12 Claims**

A method and apparatus for making filter means of a type which is constructed to provide elongated, high surface area, cavities defined on opposite sides of a relatively thin wall formed of filtering material with only the ends of the filter means contacting an overwrapped outer tube thereby presenting maximum available surface area of the material from which the products are formed to the smoke for filtration is disclosed. A tow of a suitable filtering material is passed through an air nozzle containing a mandrel centered therein, the tow thereby achieving a



uniformly random, but tubular, configuration and then through a steam curing station followed by an air curing station. The formed rod is then again steam cured and passes to a crimping device which imparts a particular configuration thereto. The crimped rod is then again air cured, wrapped, and cut. In another embodiment, an addition material may be added by means either of a printing applicator device or a pulsating nozzle device.

3,703,430

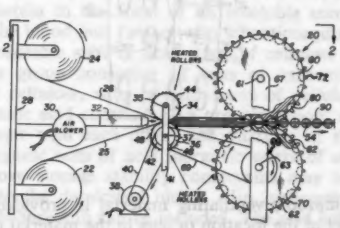
APPARATUS FOR FABRICATING PLASTIC CUSHIONING AND INSULATING MATERIAL

Joseph L. Rich, 3010 Judith Drive, Merrick, N.Y. 11566

Filed Mar. 12, 1971, Ser. No. 123,732

Int. Cl. B32b *31/00*

U.S. Cl. 156—497 **8 Claims**

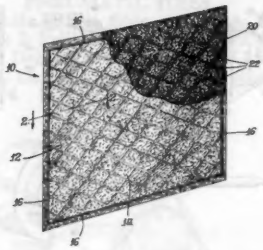


Layers of heat sealable sheet material are passed on opposite sides of a blower to axially spaced pairs of rotating rollers which form seams joining the layers while an air filled passage is maintained between each pair of longitudinal seams. The longitudinally seamed sheet material is passed through a pair of rotating rollers one or both of which have surface recesses forming transverse seams dividing the passages into closed, sealed, expanded, air filled cells.

ERRATUM

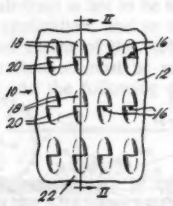
For Class 156—583 see:
Patent No. 3,703,590

3,703,431
DECORATIVE PLASTIC WALL TILE
Wayne G. Kemper, 2505 S. Grove Ave., Berwyn, Ill. 60402
Continuation-in-part of abandoned application Ser. No. 877,295, Nov. 17, 1969. This application Aug. 3, 1971, Ser. No. 168,771
Int. Cl. B44f *1/00*; B32b *3/28*; E04c *2/20*
U.S. Cl. 161—6 3 Claims



A decorative tile including a transparent body with a smooth outer surface and an embossed or crinkled backing visible through the outer surface but spaced therefrom so as to give the tile a visible, three-dimensional effect.

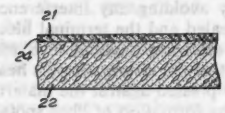
3,703,432
RAINPROOF VENTILATED PLASTIC SHEET MATERIAL FOR RAINWEAR AND METHOD OF MAKING SAME
John T. Koski, 225 W. Bidwell, Battle Creek, Mich. 49015
Filed Nov. 18, 1970, Ser. No. 90,844
Int. Cl. B37b *3/10*; A41d *3/04*
U.S. Cl. 161—110 10 Claims



A rainproof, ventilating material is provided utilizing tabs bent at the location of slits in the material to provide shielded ventilation. The material adjacent each slit is bent to form a pair of fingernail-shaped tabs, the direction of the projection of one member of the pair from the surface of the material being opposite that of the other. The pairs of tabs are aligned in one direction, so that the tabs in that one direction alternate in their direction of projection, thus, when properly oriented shielding the lower tabs by the upper tabs.

The material is formed from a substance which may be subjected to molding or deforming conditions, and, which, when molded to the desired shape may be subjected to setting conditions to retain that shape permanently. The tabs are permanently formed by cutting the slits and bending the tabs while subjecting the material to molding conditions, as for example by heating and then setting the material, as for example by cooling.

3,703,433
MOLDED GRANITE
Thomas J. Sargent, Rte. 1, Box 319, Milford, N.H. 03055
Filed May 26, 1971, Ser. No. 146,891
Int. Cl. B32b *5/16, 19/02*
U.S. Cl. 161—162 8 Claims

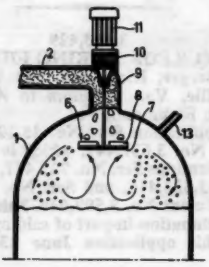


Molded products comprising flaked natural granite mixed with a resinous binder and cast or molded in or with molds of high surface finish whereby the molded products have the appearance of polished granite.

3,703,434
HEAT-ACTIVATABLE ADHESIVE SHEETS
Ronald L. Schaaf, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
No Drawing. Filed Mar. 29, 1968, Ser. No. 717,377
Int. Cl. B32b *27/38, 27/34, 15/08*
U.S. Cl. 161—167 12 Claims

A self-supporting heat-activatable adhesive sheet comprising a film of thermoplastic polyamide resin coated on both sides with a relatively thin layer of a substantially uniform blend of fusible epoxy resin and amine. The adhesive sheet has excellent shelf life at temperatures up to about 120° F. while being capable of rapidly forming strong heat-resistant compositions on both surfaces of said adhesive sheet when subjected to heat and pressure.

3,703,435
METHOD FOR FINELY DISINTEGRATING PULP, PREFERENTIALLY CELLULOSE PULP, IN CONNECTION WITH THE BLEACHING THEREOF WITH GASEOUS BLEACHING AGENT
Rudi William Schleinkofer, Nashua, N.H., assignor to Sunds Aktiebolag, Sundsvall, Sweden
Continuation of abandoned application Ser. No. 771,071, Oct. 28, 1968. This application May 14, 1971, Ser. No. 143,648
Claims priority, application Sweden, Nov. 9, 1967, 15,383/67
Int. Cl. D21c *3/26*
U.S. Cl. 162—17 8 Claims



In the course of being delivered into a generally vertical bleaching vessel, containing a gaseous bleaching agent in a free space in the upper part of the vessel, a cellulose pulp

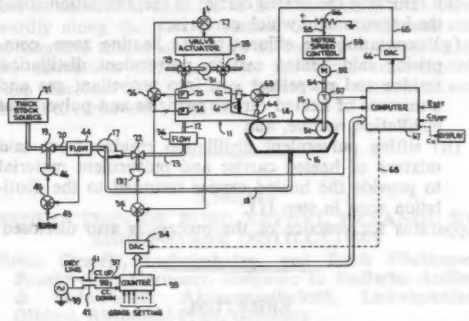
is subjected to vigorous mechanical working in a direction transverse to the falling direction thereby being finely disintegrated and fluffed.

3,703,436

ANTICIPATORY CONTROL OF HEADBOX SLICE OPENING IN A PAPER MACHINE

James S. Rice, Columbus, Ohio, assignor to Industrial Nucleonics Corporation

Filed Feb. 3, 1970, Ser. No. 8,292
Int. Cl. D21f *1/06*
U.S. Cl. 162—198 12 Claims



A headbox of a machine producing a fibrous sheet has a slice opening controlled in response to signals indicative of total head of fluid in the headbox, the rate of flow of a fibrous slurry into the headbox and the speed of a Fourdrinier wire receiving a jet of slurry emerging from the headbox slice. The slice opening is controlled to affect formation of the fibrous sheet on the wire. Consistency of the slurry being fed into the headbox is varied to control the position of a dry line on the wire or formation of fibers on the wire. The level of liquid in the headbox is maintained at a predetermined level by a controller. The slice opening is controlled in an anticipatory manner to compensate for the slow response of the total head in the headbox to changes occurring in response to the slurry mass flow rate into and out of the headbox. The controller for the slice opening is provided with deadband.

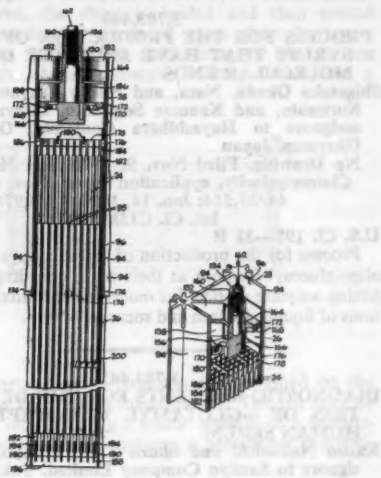
3,703,437

MEANS FOR SUPPORTING FISSILE MATERIAL IN A NUCLEAR REACTOR

Peter Fortescue, Rancho Santa Fe, and Raymond T. Shanstrom, La Jolla, Calif., assignors to Gulf Oil Corporation

Application Mar. 28, 1967, Ser. No. 648,507, now Patent No. 3,475,272, which is a continuation-in-part of application Ser. No. 374,908, June 15, 1964. Divided and this application Aug. 20, 1969, Ser. No. 870,798
Int. Cl. G21c *1/02*
U.S. Cl. 176—87 3 Claims

A nuclear power fast reactor system is described which utilizes gas as a coolant. The reactor system includes a prestressed concrete containment vessel which contains the entire primary system of the reactor, comprising the core, control rod drive mechanisms, coolant circulators, steam generators and associated main coolant ducting. The interior of the vessel is separated into two regions, the lower one containing the core and having provision for explosion absorption and water flooding. The core is comprised of fuel elements supported in a plurality of elongated tubes which depend freely from a generally horizontal grid structure. The tubes are secured in the grid structure and mate therewith at their upper ends.



ERRATUM

For Class 195—103.5 R see:
Patent No. 3,703,591

3,703,438

METHOD FOR THE STABILIZATION OF BLOOD

Stepan Ilich Dovgalev, Igor Nikolaevich Ermolenko, Evgeny Danilovich Buglov, Ivan Petrovich Danilov, and Mikhail Lvovich Longin, Minsk, U.S.S.R., assignors to Belorussky Institut Perelivania Krovi, Minsk, U.S.S.R.

No Drawing. Filed Apr. 8, 1969, Ser. No. 814,458
Int. Cl. A61k *27/10*
U.S. Cl. 195—1.8 5 Claims

Stabilization of blood by binding the calcium ions contained therein in the form of an insoluble complex by passing the blood into contact with an anticoagulant comprising insoluble salts of acid esters of cellulose selected from the group consisting of salts of carboxylic acid esters of cellulose, salts of acid esters of cellulose with an inorganic acid containing an organic cation, mixtures of the same with each other, and mixtures of the same with inorganic salts of acid inorganic esters of cellulose. To improve storage stability conservants may be introduced into the decalcified blood. Also, antiseptic agents such as levomycetin can be included. The acid esters may be prepared by reacting cellulose, for example, in the form of medical gauze, with the acids followed by converting the resultant acid esters into salts with salt solutions.

3,703,439

PROCESS FOR THE PREPARATION OF L-BETA-(3,4-DIHYDROXYPHENYL)-ALPHA-ALANINE BY FERMENTATION

Jean Florent, Jean Lunel, and Jacques Renaut, Paris, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Jan. 20, 1971, Ser. No. 108,185
Claims priority, application France, Jan. 21, 1970, 2,129
Int. Cl. C12d *3/00*
U.S. Cl. 195—29 14 Claims

L-β-(3,4-dihydroxyphenyl)-α-alanine is prepared by the microbiological hydroxylation of L-tyrosine using *Vibrio*

tyrosinaticus ATCC 19,378 as microorganism for the conversion.

3,703,440

PROCESS FOR THE PRODUCTION OF STARCH SYRUPS THAT HAVE FRUCTOSE ON THEIR MOLECULAR ENDS

Shigetaka Okada, Nara, and Naoto Tsuyama, Masashi Kurimoto, and Kaname Sugimoto, Okayama, Japan, assignors to Hayashibara Company, Okayama-shi, Okayama, Japan

No Drawing. Filed Nov. 9, 1970, Ser. No. 88,162
Claims priority, application Japan, Nov. 9, 1969, 44/89,514; Jan. 14, 1970, 45/3,976
Int. Cl. C13k *1/00*
U.S. Cl. 195—31 R 6 Claims

Process for the production of starch syrups which have oligo-glucosyl-fructose as their main constituents by subjecting amylase of *Bacillus macerans* to a mixture of solutions of liquefied starch and sucrose.

3,703,441

DIAGNOSTIC REAGENTS FOR THE DETERMINATION OF γ-GLUTAMYL TRANSPEPTIDASE IN HUMAN SERUM

Kazuo Nakanishi and Shuzo Takei, Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

No Drawing. Filed June 17, 1970, Ser. No. 47,141
Claims priority, application Japan, June 23, 1969, 44/49,592
Int. Cl. C12k *1/04*
U.S. Cl. 195—99 5 Claims

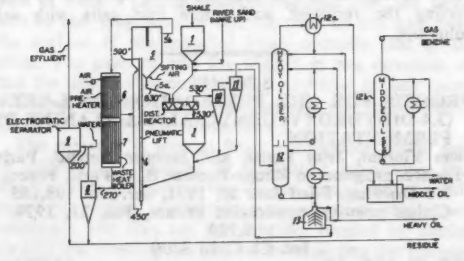
Diagnostic reagents for the determination of γ-glutamyl transpeptidase in human serum which comprises (1) γ-L-glutamic acid p-nitroanilide, (2) one or more surface active agents selected from the group consisting of amphoteric surface active agents and non-ionic surface active agents and (3) a buffer solution selected from the group consisting of collidine-, boric acid-, Veronal (5,5-diethylbarbituric acid)- and ammonia-buffer solutions. The reagents of this invention are very stable at a high concentration and practically useful for the diagnosis of various types of liver diseases, e.g. cancer of liver, obstructive liver diseases and the like.

3,703,442

METHOD FOR THE LOW-TEMPERATURE DISTILLATION OF FINELY GRANULAR BITUMINOUS MATERIALS WHICH FORM A PULVERULENT RESIDUE IN THE PROCESS

Roland Rammler, Frankfurt, and Paul Schmalfeld, Bad Homburg, Germany, assignors to Metallgesellschaft Aktiengesellschaft

Filed Feb. 18, 1970, Ser. No. 12,327
Claims priority, application Germany, Feb. 25, 1969, P 19 09 263.8
Int. Cl. C10b *49/18*
U.S. Cl. 201—12 10 Claims



In a process for low temperature distillation of finely granular bituminous or petroliferous raw materials forming a pulverulent residue during the pyrolysis which comprises:

(a) circulating a heat carrier between a distillation zone and a heating zone;

(b) introducing the raw material into the distillation zone and heating it therein for said distillation with the heat carrier, and for formation therefrom of distillation gases and said pulverulent residue;

(c) withdrawing distillation gases from the distillation zone;

(d) withdrawing the heat carrier and pulverulent distillation residue in admixture from the distillation zone;

(e) pneumatically conveying said admixture through the heating zone with a propellant gas and reheating the heat carrier therein; and

(f) returning the heated carrier to the distillation zone; the improvement which comprises

(g) separating the effluent of the heating zone, comprising said heated carrier, pulverulent distillation residue and propellant gas, into propellant gas and a mixture of heated carrier particles and pulverulent distillation residue, and

(h) sifting pulverulent distillation residue from said mixture of heated carrier and pulverulent material to provide the heated carrier returned to the distillation zone in step (f).

Apparatus for practice of the process is also disclosed.

ERRATUM

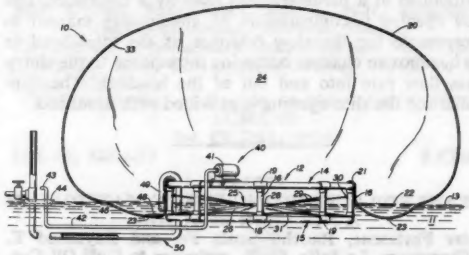
For Class 202—185 see:
Patent No. 3,703,592

3,703,443

SOLAR STILL

Archibald D. Evans, 21039 Bryant, Canoga Park, Calif. 91304

Filed Oct. 19, 1970, Ser. No. 81,747
Int. Cl. B01d *3/00*
U.S. Cl. 202—190 6 Claims



A solar still. A membrane is carried on a base frame which floats in the liquid environment from which a distillate is to be extracted. The membrane extends as a dome-like, hemispherical roof above the base frame and also contacts the surface of the liquid environment circumferentially of the base frame to encapsulate an air cell within the still. In addition, the membrane is at least partially transparent to permit access of solar energy to the upwardly directed surface of a converted means by which the solar energy produces heat. The converter means is located within the still and supported by the base frame so that at least a portion of the upwardly directed surface on the converter means lies awash of the liquid in which

the base frame is floatingly supported in order to facilitate vaporization of the liquid by the heat emitted from the converter means. Although the encapsulated air cell within the still is effectively sealed from the surrounding atmosphere so that the distillate will condense on the interior surface of the membrane, the arrangement of the converter means within the base frame permits continuous access to the converter means by the liquid environment in which the still operates. The upper surface of the converter means is inclined so that the exiting flow of residual liquid and the feeding flow of replenishing liquid induced by their relative specific gravities is augmented to effect a self-cleaning of the converter means. The thermal convection currents within the air cell as well as the action of the wind and waves on the membrane cause the droplets of condensed distillate to flow outwardly and downwardly along the interior surface of the membrane and accumulate within an involute formed by that portion of the membrane which contacts the liquid environment. Also disclosed are means to inflate the membrane and means to remove the distillate.

3,703,444

PRODUCTION OF PURE 2-ETHYL HEXANOL BY THREE-STAGE DISTILLATION

Heinz Graefje, Ludwigshafen, and Erich Flickinger, Frankweiler, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Rheinland-Pfalz, Germany

No Drawing. Filed Oct. 7, 1970, Ser. No. 78,975

Claims priority, application Germany, Oct. 17, 1969, P 19 52 333.2

Int. Cl. B01d *3/14;* C07c *29/26*

U.S. Cl. 203—78 **6 Claims**

An improved process for the production of pure 2-ethyl hexanol (obtained by hydrogenation of 2-ethylhexen-2-al-1) by continuous distillation in three columns connected in cascade fashion, the impurities boiling below 2-ethyl hexanol being taken overhead in the first column, pure 2-ethyl hexanol being taken overhead in the second column and the 2-ethyl hexanol still remaining in the higher-boiling impurities being separated in the third column, the improvement comprising the use of a pressure of from 200 to 800 mm. of Hg at the head of the second column and of a pressure of from 70 to 300 mm. of Hg at the head of the third column, sufficient 2-ethyl hexanol being left in the bottoms of the second column to make the concentration thereof at least 50%. 2-ethyl hexanol is used in the manufacture of plasticizers for polyvinyl chloride.

3,703,445

APPLYING ELECTROCONDUCTIVE HEATING CIRCUITS TO GLASS BY ELECTROPLATING

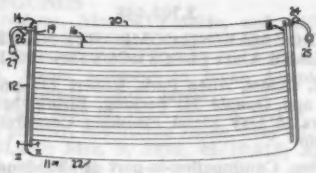
Milton S. Tarnopol, Brackenridge, and Thomas P. Snyder, Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Application July 1, 1969, Ser. No. 838,163, which is a continuation-in-part of abandoned application Ser. No. 737,907, June 18, 1968, which in turn is a continuation-in-part of application Ser. No. 826,433, May 21, 1969. Divided and this application July 20, 1971, Ser. No. 164,396

Int. Cl. C23f *17/00;* C23b *5/64;* C03c *17/06*

U.S. Cl. 204—15 **10 Claims**

Applying a decorative coating or design of electroconductive material to a glass base. When the base is transparent, the resulting article is useful as a readily heated window from which fog and ice can be readily removed on heating. A frit composition having an appropriate coefficient of expansion, an appropriate maturing temperature, and which matures into a rough, porous coating, is applied to a glass sheet surface in the circuit pattern desired, the sheet is heated and then cooled rapidly to produce a tempered glass sheet having a rough, porous frit coating conforming to the pattern desired for the electroconductive heating circuit, and a



conductive metal coating is selectively deposited on the rough, porous frit by electroless plating. The frit may be sensitized by incorporating a minor amount of a sensitizing metal therein or by applying a sensitizing composition.

3,703,446

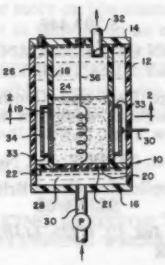
METHOD OF CARRYING OUT ELECTROCHEMICAL PROCESSES IN A FLUIDIZED-BED ELECTROLYTIC CELL

Ernest W. Haycock, El Cerrito, Calif., and Richard Prober, Trenton, N.J., assignors to Shell Oil Company, New York, N.Y.

Filed Feb. 8, 1968, Ser. No. 704,163

Int. Cl. B01k *3/00;* C23b *5/00*

U.S. Cl. 204—23 **2 Claims**



An electrolytic cell using an electrolyte and a particulate electrode in a fluidized condition to achieve a large, continuously depolarized electrode surface area.

3,703,447

METHOD OF COATING NIOBIUM WITH COPPER

Walter Lugscheider, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Mar. 27, 1970, Ser. No. 23,359

Claims priority, application Germany, Mar. 29, 1969, P 19 16 292.6

(Filed under Rule 47(b) and 35 U.S.C. 118)

Int. Cl. C23b *5/52*

U.S. Cl. 204—37 R **14 Claims**

A method of coating niobium with copper has the steps of bringing the metallically pure surface of the niobium to

be coated into contact with copper that is metallically pure at least at the surface and heating the niobium to a temperature between 800° C. and 2500° C. under a vacuum with a residual gas pressure of at most 10^{-6} torr, whereby the copper is joined to the niobium.

3,703,448

METHOD OF MAKING COMPOSITE NICKEL ELECTROPLATE AND ELECTROLYTES THEREFOR

Richard J. Clauss, Allen Park, Robert Tremmel, Woodhaven, and Donald H. Becking, Birmingham, Mich., assignors to Oxy Metal Finishing Corporation, Warren, Ohio

No Drawing. Continuation-in-part of abandoned application Ser. No. 862,942, Oct. 1, 1969. This application Aug. 31, 1971, Ser. No. 176,688

Int. Cl. C23b *5/32, 5/46, 5/50*
U.S. Cl. 204—40 20 Claims

A composite nickel-containing electroplate is formed on a base metal surface by electroplating on the surface an adherent nickel or nickel alloy layer having a thickness of from about 0.15 to 1.5 mils and an average sulfur content of less than about 0.03%. An intermediate nickel or nickel alloy layer, having a thickness of from about 0.005 to 0.2 mils and an average sulfur content of from about 0.05 to 0.3% is then electroplated on the lower layer. An adherent upper nickel or nickel alloy layer having a thickness of from about 0.2 to 1.5 mils and average sulfur content of from about 0.02 to 0.15% is then electroplated on the intermediate layer, the upper layer containing a lower percentage of sulfur then the lower layer. The source of sulfur, for at least the intermediate layer, is provided by including novel thiosulfonates of nitriles or amides in the plating bath for that layer.

3,703,449

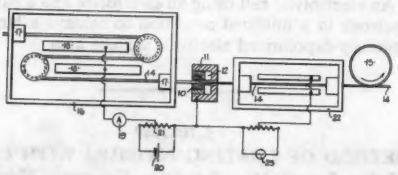
FORMATION OF LUBRICANT COATING BY ELECTROLYSIS

John Peter George Farr and Geoffrey Whaley Rowe, Birmingham, England, assignors to American Metal Climax Inc., New York, N.Y.

Filed Oct. 29, 1970, Ser. No. 85,107

Claims priority, application Great Britain, Nov. 13, 1969, 55,605/69

Int. Cl. C23b *11/02*
U.S. Cl. 204—56 R 18 Claims



A method of providing a lubricant on an article having an electrically conducting surface, such as a metal article, in order to provide lubrication during metal forming operations, comprises making the article to be coated the anode in an electrolytic cell, the electrolyte of the cell containing a soluble organic sulphur compound and then passing an electric current through the cell whereby a sulphur containing constituent is formed in the electrolyte from which the lubricant coating is produced on the surface of the article. The soluble organic sulphur compound may be thioacetamide or thiourea. If desired a further constituent may be provided in the electrolyte and the lubricant coating may be provided as a result of reaction of the sulphur containing constituent with the further constituent. The further constitutent may be ammonium molybdate.

The lubricant coating may be removed after performance of the metal forming operation by passing the article through a further electrolyte through which a current is passed to remove the lubricant coating.

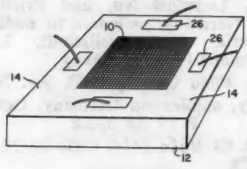
3,703,450

METHOD OF MAKING PRECISION CONDUCTIVE MESH PATTERNS

Joseph J. Bakewell, Boxford, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Filed Apr. 1, 1971, Ser. No. 130,238

Int. Cl. C23b *7/00*; B01k *1/00*
U.S. Cl. 204—11 4 Claims



A method of fabricating precision conductive mesh patterns on a repetitively usable master plate. The master plate comprises a conductive pattern formed on a non-conductive light transmissive substrate and a non-conductive pattern formed in the interstices of the conductive pattern. A reproduction of the master pattern is formed by uniform plating of a conductive pattern onto the master pattern within a matrix defined by the non-conductive pattern. The plated replica of the master pattern is then peeled from the master plate and mounted in a suitable frame for use.

3,703,451

SOLVENT EXTRACTION AND ELECTROWINNING OF COPPER

Thomas Victor Healy, Abingdon, and Alan Pilbeam, Didcot, England, assignors to United Kingdom Atomic Energy Authority, London, England

No Drawing. Filed Sept. 13, 1971, Ser. No. 180,140

Claims priority, application Great Britain, Sept. 18, 1970, 44,582/70

Int. Cl. C22d *1/16*; C22b *3/00, 15/00*
U.S. Cl. 204—106 9 Claims

Copper is extracted from dilute aqueous solution by adding excess chloride, reducing dissolved copper from the cupric to the cuprous state, e.g. using sulphur dioxide, and performing a solvent extraction operation using a solution, in an inert water-immiscible liquid, of a tri-(alkyl or aryl) phosphite as an extractant. The copper may be recovered by backwashing the water-immiscible phase with aqueous ammonia, and then depositing the metal by electrolysis.

3,703,452

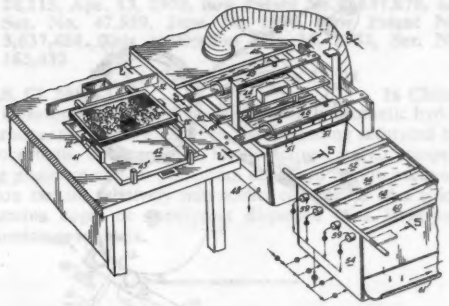
ELECTROPOLISHING OF DRILLED SURGICAL NEEDLES

Howard Beroff, Somerville, and Ernest L. Richmond, North Plainfield, N.J., assignors to Ethicon, Inc.

Continuation-in-part of application Ser. No. 6,878, Jan. 29, 1970. This application Jan. 27, 1972, Ser. No. 221,256

Int. Cl. C23b *3/06, 5/70;* B23p *1/10*

U.S. Cl. 204—129.1 12 Claims



A large number of steel surgical needles are supported in a magnetic field on a platinum, palladium, rhodium, iridium, or gold anode that is immersed in a magnetic electropolishing bath. The needles supported on the anode are polished by a current that flows through the solution and needles to produce a smooth needle surface that is free of flaws at the point of contact with other needles on the anode.

3,703,453

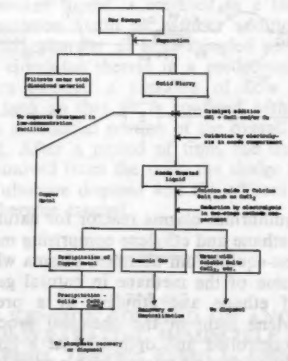
ELECTROLYTIC DESTRUCTION OF SEWAGE

John Gordy, Richmond, British Columbia, and Douglas R. Harris, Delta, British Columbia, Canada, assignors to Stellar Industries Ltd., Vancouver, British Columbia, Canada

Filed Sept. 1, 1970, Ser. No. 68,694

Int. Cl. C02c *5/12*

U.S. Cl. 204—151 5 Claims



A method for the electrolytic destruction of waste material such as sewage, organic process waste materials, and the like; involving oxidation by electrolysis in the anode compartment of an electrolytic cell, in the presence of hydrochloric acid and cuprous chloride. This results in the formation of oxidation products. The resulting liquid may be reduced by electrolysis in the cathode compartment of the electrolytic cell, and this will permit recovery of the copper catalyst.

3,703,454

POLYMERIZATION OF TETRAOXANE IN THE PRESENCE OF SULFUR AND SULFUR COMPOUNDS

Yoshiaki Nakase, Masaru Yoshida, and Akihiko Ito, Takasaki, Tadashi Iwai, Kanagawa, Koichiro Hayashi, Sapporo, Seizo Okamura, Kyoto, and Katsumi Kojima, Oimachi, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed May 21, 1970, Ser. No. 39,213

Claims priority, application Japan, May 26, 1969, 44/41,277; Mar. 9, 1970, 45/19,615; Apr. 4, 1970, 45/28,362

Int. Cl. C08d *1/00;* C08f *1/16, 3/40*

U.S. Cl. 204—159.21 16 Claims

In a process for polymerizing tetraoxane, sulfur or an organic sulfur compound which is admixed to tetraoxane acts as polymerization initiator for tetraoxane. Some of the organic sulfur compounds, such as thiiranes, thiocyanates and trithianoxides, improve heat stability of the produced polyoxymethylene remarkably.

3,703,455

ELECTROCOATING METHOD BASED ON COPOLYMERS CONTAINING MALEIC HALF ESTERS

Kazys Sekmakas, Chicago, Ill., assignor to De Soto, Inc., Des Plaines, Ill.

No Drawing. Continuation-in-part of application Ser. No. 885,273, Dec. 15, 1969. This application Apr. 21, 1970, Ser. No. 30,588

Int. Cl. B01k *5/02;* C23b *13/00*

U.S. Cl. 204—181 24 Claims

Styrene and like ethylenic monomers are copolymerized with maleic, fumaric or itaconic half esters; maleic, fumaric or itaconic bis esters being optionally present, at least a portion of the ester groups including a hydrocarbon chain containing 6 or more carbon atoms. The copolymerization is carried out in solution in an ether alcohol, such as 2-butoxy ethanol, or in bulk. The copolymers may be reacted with a small proportion of monoepoxide. The copolymers are dispersible in water with the aid of a base and are particularly adapted to electrodeposit corrosion and detergent resistant films.

3,703,456

METHOD OF MAKING RESISTOR THIN FILMS BY REACTIVE SPUTTERING FROM A COMPOSITE SOURCE

Linus F. Cordes, Schenectady, N.Y., assignor to General Electric Company

Filed Dec. 22, 1969, Ser. No. 887,440

Int. Cl. C23c *15/00*

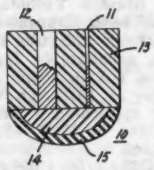
U.S. Cl. 204—192 7 Claims

A method of making high resistivity thin film resistors by reactively sputtering a composite source onto a substrate is described. The composite source comprises a first material selected from the group consisting of chromium, silicon, beryllium, aluminum and magnesium and a second material selected from the group consisting of molybdenum, tantalum, tungsten, gold, silver, platinum, osmium and iridium. In the presence of a reactive gas such as nitrogen, the first materials form a high resistivity nitride on the substrate and the second materials either form a low resistivity nitride on the substrate or are non-reactive with the nitrogen and remain in their elemental states. The resulting thin films have resistivities ranging between the high resistivity nitrides and the low resistivity nitrides depending upon the composition of the composite source.

3,703,457
SENSOR WITH ANION EXCHANGE RESIN ELECTROLYTE

Leonard W. Niedrach and William H. Stoddard, Jr., Schenectady, N.Y., assignors to General Electric Company

Filed Oct. 15, 1970, Ser. No. 80,902
Int. Cl. G01n 27/46
U.S. Cl. 204—195 P 4 Claims

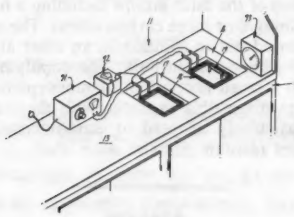


A sensor has a rigid electrically insulating matrix, at least a pair of generally parallel, elongated electrodes embedded in the matrix, the electrodes electrically insulated from each other by the matrix material and opposite ends exposed, an anion exchange resin electrolyte contacting the exposed ends of the electrodes at one end of the matrix and an outer sheath of diffusion barrier material encapsulating at least the electrodes and the electrolyte. Methods of manufacturing such sensors are also described.

3,703,458
ELECTROLYTIC ETCH APPARATUS

Benjamin Hays Read, San Jose, and Rexford E. Black, Sunnyvale, Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed July 13, 1970, Ser. No. 54,491
Int. Cl. B65g 49/00; B23p 1/02
U.S. Cl. 204—198 11 Claims



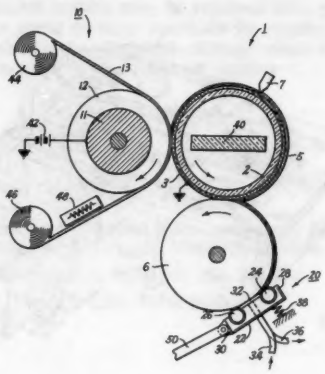
Electrolytic etch apparatus for processing articles having a layer of aluminum thereon comprising a tank adapted to carry an etch solution with an electrode assembly mounted in the tank and having first and second electrodes disposed in the etch solution. A boat assembly adapted to carry a plurality of the articles is disposed in the etch solution so that the articles are in contact with the etch solution. The boat assembly is provided with the means for making intimate electrical contact with each of the articles. The electrode assembly includes means for making contact between the boat assembly and one of the electrodes. A power supply is connected to the electrodes for causing a current to flow between the electrodes and through the etch solution. The electrode assembly also includes means for preventing the formation of a substantial number of bubbles in the vicinity of the articles so that bubbles will not occlude certain areas of the aluminum which are to be removed.

In the method, exposed aluminum carried by the articles is removed electrolytically until certain discontinuities occur in the aluminum, and thereafter the remaining aluminum is removed chemically.

3,703,459
LIQUID APPLICATOR

William S. Little, Jr., Rochester, and Robert H. Townsend, Webster, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed Nov. 9, 1970, Ser. No. 87,720
Int. Cl. B01k 5/02
U.S. Cl. 204—300 3 Claims

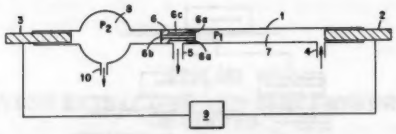


A liquid applicator is provided adapted to apply a liquid film of imaging suspension to the injecting electrode in an electrophoretic imaging system.

3,703,460
NON-EQUILIBRIUM PLASMA REACTOR FOR NATURAL GAS PROCESSING

Frederick H. Shair, Altadena, and Arakali L. Ravimohan, Pasadena, Calif., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Sept. 30, 1970, Ser. No. 76,866
Int. Cl. B01k 1/00; C07c 3/24
U.S. Cl. 204—327 2 Claims



A non-equilibrium plasma reactor for natural gas processing into ethane and ethylene comprising means of producing a non-equilibrium chemical plasma wherein selective conversion of the methane in natural gas to desired products of ethane and ethylene at a pre-determined ethane/ethylene ratio in the chemical process may be intimately controlled and optimized at a high electrical power efficiency rate by mixing with a recycling gas inert to the chemical process such as argon, helium, or hydrogen, reducing the residence time of the methane in the chemical plasma, selecting the gas pressure in the chemical plasma from a wide range of pressures, and utilizing pulsed electrical discharge producing the chemical plasma.

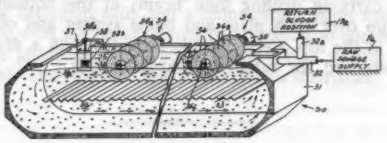
ERRATUM

For Class 204—192 see:
Patent No. 3,703,585

3,703,461
HYDROGENATION PROCESS AND CATALYST
Rowland C. Hansford, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
No Drawing. Continuation-in-part of applications Ser. No. 28,115, Apr. 13, 1970, now Patent No. 3,637,878, and Ser. No. 47,559, June 18, 1970, now Patent No. 3,637,484. This application July 16, 1971, Ser. No. 163,432
Int. Cl. C07c *5/10*; C10g *23/04*
U.S. Cl. 208—143 **16 Claims**

Unsaturated hydrocarbons, particularly aromatic hydrocarbons, are hydrogenated to corresponding saturated hydrocarbons, using a novel, highly active catalyst comprising platinum and/or palladium deposited by ion exchange upon certain relatively non-acidic, composites of a silica-alumina cogel or copolymer dispersed in a large-pore alumina gel matrix.

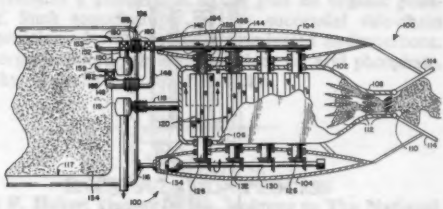
3,703,462
SEWAGE TREATMENT APPARATUS AND METHOD
George W. Smith, 2639 W. 32nd Place, Chicago, Ill. 60609
Filed Jan. 6, 1971, Ser. No. 104,360
Int. Cl. C02c *1/10*
U.S. Cl. 210—7 **11 Claims**



A method and apparatus for use in an activated sludge process of treating waste water wherein raw sewage or the like is mixed with return (activated) sludge and the so-mixed sewage liquor is confined in a tank and subjected to aeration (with or without additional sub-surface aeration) whereby air is co-mingled with the sewage liquor and circulated therein in a predetermined vertical flow pattern through a plurality of flow passageways within the tank so that air is confined within the waste water for a substantial portion of the overall waste water flow circuit. After a period of time, the treated sewage liquor is removed from the tank, the sludge removed for recycle or ultimate disposal and the effluent water clarified and otherwise treated.

3,703,463
SURFACE TENSION METHOD OF AND APPARATUS FOR SEPARATING IMMISCIBLE LIQUIDS
Pravin G. Bhuta, Torrance, Robert L. Johnson, Marina Del Rey, and Douglas J. Graham, Redondo Beach, Calif., assignors to TRW Inc., Redondo Beach, Calif.
Filed June 29, 1970, Ser. No. 50,640
Int. Cl. E02b *15/04*
U.S. Cl. 210—23 **22 Claims**

A method of an apparatus for separating a selected liquid from a second liquid in which the selected liquid is immiscible by a surface tension action utilizing a hollow liquid surface tension separator having a surface tension screen wall is described. The separator is filled with the selected liquid and the outer side of its surface tension screen is placed in contact with the body of immiscible liquids to be separated, such that each screen pore exposed to the second liquid of the body contains a liquid-liquid interface whose interfacial surface tension resists passage of the second liquid through the pore. A pressure differential, less than the critical pressure differential necessary to overcome the interfacial surface tension force acting across the pore, is established across the screen to drive the selected liquid only through the screen into the separator. The primary application of the invention involves the removal or recovery of oil from a water surface utilizing an oil recovery apparatus which floats on and in some cases is propelled along the water surface and is equipped with one or more surface tension liquid separators for extracting the oil from the water surface.



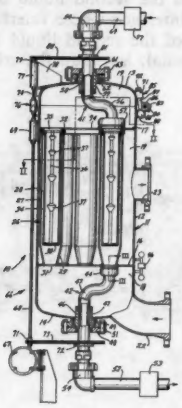
3,703,464
TREATMENT OF OIL SPILLS
Richard L. Ferm, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.
No Drawing. Filed May 20, 1971, Ser. No. 145,487
Int. Cl. C02b *9/02*
U.S. Cl. 210—40 **10 Claims**

A process for treating petroleum product spills is disclosed, whereby coconut husk material is spread on the spill to absorb it. When the spill is on fresh or salt water in the form of a "slick," the coconut husk material coagulates the film, keeps it from sinking, and forms a mass which lends itself to easy removal from the water by mechanical pickup and the like.

3,703,465
FILTER WITH ROTATING BACKWASH SELECTOR
Thomas L. Reece, Portage, and Thurman E. Bryant, Richland Township, Kalamazoo County, Mich., assignors to Dover Corporation, New York, N.Y.
Filed Dec. 14, 1970, Ser. No. 97,843
Int. Cl. B01d *35/12, 29/38*
U.S. Cl. 210—333 **8 Claims**

A filter assembly having a plurality of individual filter units, each including an impervious outer skirt surrounding an elongated filter member. A fluid-solid mixture is supplied to the filter units in a direction to flow radially inwardly through the filter member. Rotatable backwash arms are disposed adjacent the opposite ends of the filter units for sequentially and progressively permitting backwashing thereof. The backwash fluid flows radially outwardly through the filter members for removing the collected solid material. The backwash arms are connected to inlet and outlet pipes, with the inlet pipe being connected

to an external source of a separate backwash fluid. The backwash arms are rotatably driven by means of an external drive system which includes disconnectible means



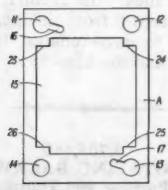
for enabling one end of the filter housing to swingably move into an open position, carrying with it the backwash arm connected thereto, for permitting servicing of the individual filter units.

3,703,466

DIALYSERS AND SPACER FRAMES THEREFOR

Jean Laforest, Saint-Cyr-Au-Mont-D'Or, Rhone, and Pierre Miton, Lyon, Rhone, France, assignors to Rhone-Poulenc S.A., Paris, France

Filed Dec. 7, 1970, Ser. No. 95,694
Claims priority, application France, Dec. 12, 1969, 6943177
Int. Cl. B01d *31/00*
U.S. Cl. 210—321 **7 Claims**



A spacer frame for a dialyser and a dialyser including such a frame formed from thin sheets of resilient material. The spacer frames are made up of at least two thin laminal elements having four duct forming orifices therein, and a central cell forming orifice. Extension portions are provided for two of the duct forming orifices in one of a laminal element and extension parts are provided for the cell forming orifice of the other laminal element, the extension parts and portions overlying to provide a communication between the two duct forming orifices and the cell, no one laminal element having a channel extending from a duct forming orifice to a cell forming orifice, thus reducing leakage and pressure loss.

3,703,467

VERTICAL SEPARATOR FOR DRILLING FLUIDS

James L. Lummus, Tulsa, Okla., and Leroy J. Field, Calgary, Alberta, Canada, assignors to Pan American Petroleum Corporation, Tulsa, Okla.

Filed Jan. 28, 1971, Ser. No. 110,425
Int. Cl. B01d *21/10*
U.S. Cl. 210—522 **9 Claims**

This invention relates to a separator for removing cuttings from drilling fluid. This separator has a series of inclined flow plates inside a vertical tank. The flow planes or plates are zigzagged, that is, adjacent plates are inclined in opposite direction. Each plate is provided with vertical, slanting baffles. The flow path of the solids carrying drilling fluid begins at the bottom and flows up over each plate and baffle system and out the outlet at the top. Each plate is provided with a drain at its lower end for removing trapped solids.

3,703,468

WATER-SCAVENGING COMPOSITION FOR HYDRAULIC FLUIDS

Samuel Chess, Palos Verdes Estates, and Bruce B. Cleveland, San Pedro, Calif., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Mar. 9, 1971, Ser. No. 122,554
Int. Cl. C09k *3/00*
U.S. Cl. 252—77 **8 Claims**

Water-scavenging compositions are provided containing a mixture of (a) polymethylene polyphenyl polyisocyanate and (b) a 2,2-di(lower-alkoxy)propane or a tri(lower-alkyl)orthoformate or mixtures thereof. These compositions are particularly useful in combination with hydraulic fluids which are to be operated at temperatures below the freezing point of water.

3,703,469

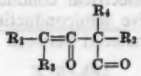
LOW-FOAMING RINSING, WASHING AND CLEANING COMPOSITIONS

Werner Stein, Erkrath-Unterbach, and Klaus Flory, Leimen, Germany, assignors to Henkel & Cie GmbH, Dusseldorf, Germany

No Drawing. Filed Dec. 9, 1970, Ser. No. 96,672
Claims priority, application Germany, Dec. 31, 1969, P 19 65 639.4
Int. Cl. C11d
U.S. Cl. 252—89 **14 Claims**

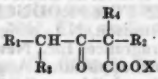
Low-foaming rinsing, washing and cleaning compositions comprising (a) from 90% to 99.9% by weight of

at least one compound having a cleaning or complexing action, and (b) from 0.1% to 10% by weight of at least one foam-inhibiting compound of the Formula I



(I)

and its saponification product of the Formula II



(II)

wherein R_1 and R_2 represent hydrocarbon radicals with 8 to 30 carbon atoms and R_3 and R_4 represent hydrogen or hydrocarbon radicals with 1 to 30 carbon atoms, and X represents a cation.

3,703,470

STORAGE STABLE DETERGENT COMPOSITION

William R. Brennan, Cincinnati, Ohio, assignor to Chemed Corporation, Cincinnati, Ohio

No Drawing. Filed Oct. 6, 1970, Ser. No. 78,626
Int. Cl. C11d *7/56*
U.S. Cl. 252—99 2 Claims

A chlorinated machine dishwashing detergent composition and process of preparing same. The process includes spraying a mixture of a poly(oxyalkylene) glycol defoamer and a low foaming organic, non-ionic surfactant onto an agitated mass of anhydrous detergent salt. The mixture is then sprayed with a solution of a water-soluble resin. The remaining ingredients of the composition typically including detergent salts and a chlorinating agent are then blended with the encapsulated combination to comprise a storage stable detergent composition which retains both available chlorine and low foaming characteristics.

3,703,471

SYNERGISTIC ANTISEPTIC COMPOSITIONS

Moneeb Zakaria, Chicago, Leo A. Raphaelian, Wilmette, David Taber, Evanston, and James Brown, Jr., Chicago, Ill., assignors to Armour-Dial, Inc., Chicago, Ill.

No Drawing. Filed July 20, 1970, Ser. No. 56,719
Int. Cl. C11d *3/48*
U.S. Cl. 252—107 4 Claims

Compositions possessing antibacterial activity through the effect of synergistic mixtures of 2,2'-methylene-bis-(3,4,6-trichlorophenol) - di - (N - methylcarbamate) and 3,3',4,4'-tetrachlorocarbanilide.

3,703,472

PINE-AMMONIA DETERGENT COMPOSITION

Irving Franklin Shaw, East Rockaway, and Stephen David Hinden, Bronx, N.Y., assignors to West Laboratories, Inc., Long Island City, N.Y.

No Drawing. Filed July 29, 1970, Ser. No. 59,374
Int. Cl. C11d *9/50, 1/18, 1/50*
U.S. Cl. 252—107 3 Claims

A pine-ammonia detergent composition is provided wherein the composition exhibits a predominant ammonia odor at the product level which is reversed to a predominant and lingering pine odor at the use dilution level by providing a pine oil to ammonia ratio of at least about 1:1 in the detergent composition and, preferably, from about 2:1 to 10:1.

3,703,473

SEQUESTERING AGENTS FOR METAL ION CONTAMINATION OF ALKYL-AROMATIC HYDROCARBONS

Ralph H. Lasco, Painesville, Ohio, assignor to Diamond Shamrock Corporation

No Drawing. Original application June 29, 1966, Ser. No. 561,340, now Patent No. 3,580,854. Divided and this application Aug. 17, 1970, Ser. No. 64,619
Int. Cl. B01j *1/10*; C07c *17/14, 75/14*
U.S. Cl. 252—188.3 10 Claims

Metal ion contamination in alkyl-aromatic hydrocarbons, such as trace amounts of iron in p-xylene, is sequestered with a synergistic mixture of agents. This mixture contains a phosphorus halide plus an organic phosphate. Such sequestration permits successful side-chain halogenation of even visibly contaminated hydrocarbons. The organic phosphate is provided by an aryl phosphate, an alkyl phosphate, or their mixtures.

3,703,474

ENCAPSULATION PROCESS

Hans F. Huber, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

No Drawing. Filed Aug. 21, 1967, Ser. No. 661,822
Int. Cl. B01j *13/02*; B44d *1/02*
U.S. Cl. 252—316 5 Claims

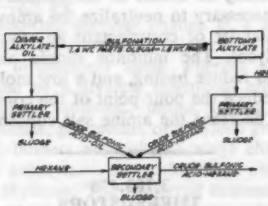
A process is provided for preparation of minute capsules wherein particles of intended internal phase material which have been dispersed individually in a liquid manufacturing vehicle are coated by a solid polymeric film-forming material. Polymeric material is precipitated from solution in the manufacturing vehicle or from solution in the intended internal phase material due to a "zone of insolubility" established at the interface between the particles and the manufacturing vehicle. The particles are either liquid droplets or solid particles having an associated liquid therewith. The novel process is utilized to encapsulate particles which are, to some degree, miscible with the manufacturing vehicle.

3,703,475

PREPARATION OF OIL SOLUBLE SULFONIC ACIDS USEFUL AS DISPERSANT ADDITIVES

Roy C. Sias, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed June 21, 1971, Ser. No. 155,081
Int. Cl. B01f *17/12*
U.S. Cl. 252—353 20 Claims



A sulfonic acid composition is prepared by separately sulfonating (a) an alkylate composition consisting essentially of one or more monoalkaryl compounds in which the alkyl substituent contains from about 20 to about 40 carbon atoms, and (b) an alkylate composition containing from about 5 weight percent to about 35 weight percent diphenylalkanes, from about 5 weight percent to about 50 weight percent alkylated tetralins, and from about 25 weight percent to about 75 weight percent dialkylbenzenes, and having an average molecular weight

of from about 300 to about 500. The sulfonic acid reaction mixtures derived from the two alkylates are then separately gravity settled and a primary acid-sludge split is taken to remove the sludge from each reaction mixture. The de-sludged crude sulfonic acids from the two alkylates are then mixed and dissolved in hexane. The hexane solution of the mixed sulfonic acids is then permitted to settle and another acid-sludge split is made to remove the sludge. The first alkylate starting material may be a so-called dimer alkylate prepared by alkylating benzene with a dimerized tetramer of propylene, and the second alkylate starting material may be a bottoms fraction yielded in the fractionation of an alkylate mixture produced by alkylating benzene with normal chloroparaffins containing 8 to 18 carbon atoms.

3,703,476

METHOD FOR FORMING AN OILY FLUID-WATER-SOLUBLE SOLID PARTICLES SLURRY

Paul E. Titus, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed Oct. 27, 1969, Ser. No. 869,769
Int. Cl. B01j *13/00*
U.S. Cl. 252—309 7 Claims

A method for forming a slurry of an oily fluid and water-soluble solid particles for transportation through a pipeline by flowing a substantial amount of water-soluble solid particles through a mixer while continuously flowing an oily fluid into contact with the particles flowing through the mixer in an amount in excess of that sufficient to form a slurry therewith and under flow conditions whereby turbulence is created whereby the resulting turbulence effects distribution of the solid particles in the oily fluid. Excess oily fluid is then removed from the slurry while leaving sufficient oily fluid therein to maintain the slurry in a flowable condition and the slurry after removal of the excess oily fluid, may be flowed into a pipeline for transportation therethrough.

3,703,477

CORROSION INHIBITOR CONTAINING SULFURIZED TALL OIL

Loyd W. Jones, Tulsa, Okla., assignor to Pan American Petroleum Corporation, Tulsa, Okla.

No Drawing. Filed Jan. 18, 1971, Ser. No. 107,585
Int. Cl. C23f *11/16, 11/14*
U.S. Cl. 252—391 8 Claims

A corrosion inhibitor includes an amine salt of sulfurized tall oil fatty acids, or equivalents. The usual emulsion problems accompanying use of amine salts of ordinary tall oil fatty acids are overcome by sulfurizing these acids, using an excess of the sulfurized acids over the amount necessary to neutralize the amine and including as an extender or cosurfactant an ethoxylated polypropylene glycol. The inhibitor should also include a little water, to reduce hazing, and a low molecular-weight alcohol, to reduce the pour point of the composition, and a solvent to decrease the amine salt concentration.

3,703,478

THERMISTORS

Robert C. De Vries, Burnt Hills, and James F. Fleischer, Scotia, N.Y., assignors to General Electric Company

Filed July 1, 1971, Ser. No. 158,802
Int. Cl. H01c *7/04*; H01b *1/08*
U.S. Cl. 252—521 11 Claims

Thermistors are provided in which the thermally sensitive semiconducting material consists essentially of a compound having the formula:

$$PbO \cdot PbZ''O_4$$

wherein Z'' is a member selected from the group consisting of chromium, molybdenum, and mixtures thereof, and 0.05–5.0 mole percent of a compound having the formula M_2O_3, wherein M is a member selected from the group consisting of scandium, yttrium, and the rare earth elements. The thermistor device can be made by dipping two closely spaced electrical conductors into a melt of the thermally sensitive semiconducting material to form an element of the material between the conductors.

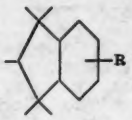
3,703,479

SATURATED INDANE DERIVATIVES AND PROCESSES FOR PRODUCING SAME

Ernst T. Theimer, Rumson, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

No Drawing. Original application Aug. 18, 1969, Ser. No. 851,048. Divided and this application Sept. 28, 1971, Ser. No. 184,641
Int. Cl. A61k *27/00*
U.S. Cl. 252—522 3 Claims

A perfume composition containing as an essential fragrance ingredient a saturated indane compound of the formula



wherein R is carbonyl oxygen.

3,703,480

FABRIC-SOFTENER COMPOSITIONS

Paul Sheldon Grand, South Bound Brook, and Harold Eugene Wixon, New Brunswick, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Nov. 16, 1970, Ser. No. 90,133
Int. Cl. C11d *1/40, 1/50, 1/58*
U.S. Cl. 252—524 13 Claims

A washing-cycle fabric softener consisting essentially of a cationic quaternary ammonium fabric softener and an amino polyureylene resin wherein the weight ratio of softener to resin is from about 0.16:1 to about 4:1 for di-higher alkyl quaternary ammonium softeners and 0.5:1 to 2:1 for imidazoline softeners. Such compositions effectively soften textiles in the presence of anionic detergent compositions. Another aspect of the invention is detergent-softener compositions containing the washing-cycle softener composition in combination with an anionic detergent and, optionally, a water-soluble builder salt. Also within the scope of the invention is a method of softening textiles.

3,703,481

AQUEOUS-BASED COSMETIC DETERGENT COMPOSITIONS

Graham Barker, Fair Lawn, N.J., and Herman W. Campbell, Chicago, Ill., assignors to Witco Chemical Corporation, New York, N.Y.

No Drawing. Filed Jan. 25, 1971, Ser. No. 109,614
Int. Cl. C11d *1/20*
U.S. Cl. 252—546 11 Claims

Improved aqueous detergent compositions for cosmetic applications comprising water, a synthetic organic detergent, and from about 1–20%, by weight, of an ammonium, alkanolamine or alkali metal salt of a monoester of a C_3–C_6 saturated aliphatic dicarboxylic acid with a fatty acid alkanolamide. The compositions exhibit improved properties with regard to emolliency, wetting, lathering and the like.

ERRATA

For Classes 252—470, 252—501 and 260—45.95 R see: Patents Nos. 3,703,586, 3,703,593 and 3,703,594

3,703,482
POLYURETHANE FOAM

Fred A. Coglianese, Hackettstown, and John E. McCorkle, Somerville, N.J., assignors to Johns-Manville Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 102,375, Apr. 12, 1961. This application Mar. 15, 1962, Ser. No. 180,007

Int. Cl. C08g *22/04*

U.S. Cl. 260—2.5 AK **9 Claims**

The invention relates to the polyurethane foam art and comprises producing polyurethane foams wherein a wood resin containing active hydrogens is incorporated into either or both of the polymerizable foam ingredients.

3,703,483
POLYMERIZATION PROCESS AND CATALYST SYSTEM THEREFOR

John E. Bozik, Pittsburgh, Harold E. Swift, Gibsonia, and Ching-Yong Wu, Pittsburgh, Pa., assignors to Goodrich-Gulf Chemicals Inc., Cleveland, Ohio

No Drawing. Original application Mar. 10, 1969, Ser. No. 812,536, now Patent No. 3,565,875, dated Feb. 23, 1971. Divided and this application July 9, 1970, Ser. No. 61,013

Int. Cl. C08g *23/14*

U.S. Cl. 260—2 A **9 Claims**

Process for polymerizing olefins, diolefins and alkylene oxides in the presence of a catalyst system comprised of an iron complex, a trialkyl aluminum compound and a bidentate ligand capable of both pi (π) and sigma (σ) bonding to form a five or six-membered ring.

3,703,484
POLYURETHANE FOAM PROCESS USING DISTANNOXANE/AMINOALCOHOL CATALYST COMBINATION

Akizo Keshi, Takatsuki, Kunio Yoshii, Osaka, Makoto Yokoo, Toyonaka, and Kaichi Nakai, Itami, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Continuation of abandoned application Ser. No. 656,340, July 27, 1967. This application Dec. 2, 1970, Ser. No. 94,562

Claims priority, application Japan, July 29, 1966, 41/49,930; Sept. 10, 1966, 41/60,050

Int. Cl. C08g *22/38, 22/42, 22/46*

U.S. Cl. 260—2.5 AC **5 Claims**

Non-yellowing flexible polyurethane foam is prepared by reacting dimethylbenzene ω,ω'-diisocyanate and polyol in the presence of a blowing agent, monoamino alcohol having 1 to 4 carbon atoms and octaalkyl-stannoxane catalyst.

3,703,485
PROCESS FOR PRODUCING VINYL RESIN FOAMS

Nicolas Fischer, Paris, France, assignor to Rhone-Progil, Paris, France

No Drawing. Continuation of abandoned application Ser. No. 699,297, Jan. 22, 1968. This application Dec. 21, 1970, Ser. No. 100,538

Claims priority, application France, Feb. 6, 1967, 93,856

Int. Cl. C08f *47/08*

U.S. Cl. 260—2.5 P **12 Claims**

The process for the preparation of cellular foamed products of polyvinyl resin plastisols in which the plastisol is formulated to contain an alkali metal alkylsulphate as an essential component in an amount within the range of 1–15 parts by weight per 100 parts by weight of resin or an alkali metal alkylsulphate and alkanolamine alkylsulphate and preferably the combination of an alkali metal alkylsulphate, an alkanolamine alkylsulphate, an alkylene oxide-alcohol or phenol condensation product and an alkanolamide in the ratio of 1–15 parts by weight of the alkali metal alkylsulphate, 1–10 parts by weight of the alkanolamine alkylsulphate, 0.5–4 parts by weight of the condensation product and 0.1–4 parts by weight of the alkanolamide per 100 parts by weight of resin, after which the mixture is foamed by agitation and heated to set the foamed plastisol.

3,703,486
PROCESS FOR FOAMING ORGANIC LIQUIDS

Joseph W. Keil, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Application Apr. 28, 1965, Ser. No. 451,617, now Patent No. 3,511,788, dated May 12, 1970, which is a continuation of abandoned application Ser. No. 430,193, Feb. 3, 1965, which in turn is a continuation-in-part of abandoned application Ser. No. 319,512, Oct. 28, 1963. Divided and this application Aug. 27, 1969, Ser. No. 853,497

Int. Cl. C08c *17/08*

U.S. Cl. 260—2.5 AA **10 Claims**

A process is disclosed for preparing a foam which comprises adding at least 0.1% by weight of a copolymer consisting essentially of SiO_2 units and units selected from the group consisting of

$$(CH_3)_3SiO_{1/2} \text{ and } Q(CH_3)_2CiO_{1/2}$$

units, wherein Q is a radical containing a solubilizing group that makes the copolymer compatible with the material to which it is added, and the ratio of SiO_2 units to the total (CH_3Si and $Q(CH_3)_2Si$ units is in the range of 1:0.6 to 1:1.2, to an organic liquid having a surface tension of at least 22.2 dynes per centimeter at 20° C. when in contact with air, and then expanding said liquid with a gas.

3,703,487
INTUMESCENT COATING COMPOSITION

Joseph Green, East Brunswick, and Shirley H. Roth, Highland Park, N.J., and John J. Seipel, Amber, Pa., assignors to Cities Service Company, New York, N.Y.

No Drawing. Filed Nov. 5, 1971, Ser. No. 196,230

Int. Cl. C08j *1/20*

U.S. Cl. 260—2.5 FP **9 Claims**

A binder showing thermal change at a suitable temperature is used to dissolve or disperse a bis(aromatic sulfonamide) intumescent agent wherein the aromatic rings are linked by a divalent functional group, such as oxy, thio, sulfinyl, sulfonyl, imino, ureido, thioureido, guanido, carbonate, phosphate, or alkylene group. Among the preferred binders are suitable vinyl chloride-vinylidene chloride copolymers and chlorinated and chlorosulfonated polyethylenes. The preferred intumescent agents are those in which two benzenesulfonamide groups are linked by an oxy, ureido, sulfonyl, or imino group.

3,703,488
PROCESS FOR REUSE OF POLYESTER RESIN

Donald E. Morton, Edwardsville, Ill., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Mar. 22, 1968, Ser. No. 715,185

Int. Cl. C08g *53/22*

U.S. Cl. 260—2.3 **7 Claims**

The invention is a method for depolymerizing polyester resin such as high molecular weight scrap by charging the

resin with a small amount of a material selected from the group consisting of materials from which the polyester resin is derived into a worm extruder and extruding the mixture at a temperature of from 260 to 320° C. The high molecular weight resin is reduced in viscosity to a degree of polymerization in the range of from about 10 to about 40 and may be reused in the preparation of new resin.

3,703,489

PROCESS FOR PRODUCING POLYURETHANE FOAMS

Edward L. Morehouse, New City, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 842,751, May 5, 1969, which is a division of application Ser. No. 573,133, Aug. 12, 1966, now Patent No. 3,505,377. This application Apr. 6, 1971, Ser. No. 131,765

Int. Cl. C08g *22/46;* B01f *17/54*

U.S. Cl. 260—2.5 AH 14 Claims

A process is provided for the production of a flexible polyurethane foam wherein particular siloxaneoxyalkylene block copolymers are employed. The oxyalkylene block of the copolymer has a molecular weight of at least 1500 and the formula, $R'O(C_3H_6O)_m(C_2H_4O)_n$, wherein R' is a monovalent hydrocarbon group having from 1 to 10 carbon atoms. The siloxane block of the copolymer comprises at least 40 and up to 200 dimethylsiloxane units and constitutes from 15 to 70 weight percent of the block copolymer. The siloxaneoxyalkylene copolymers employed in the process have improved potency for the stabilization of polyether urethane foams and may be used in the form of a solution in a water-soluble organic solvent.

3,703,490

DICYCLOPENTADIENE DIEPOXIDE AS A THERMAL STABILIZER FOR POLY(VINYL CHLORIDE)

Harold R. Hersh and Richard W. Sauer, Cherry Hill, N.J., assignors to Atlantic Richfield Company, New York, N.Y.

No Drawing. Filed Mar. 1, 1971, Ser. No. 119,918

Int. Cl. C08f *45/62*

U.S. Cl. 260—23 XA 2 Claims

Thermal stabilization of polyvinyl chloride utilizing metal salts can be improved when cycloaliphatic epoxides are utilized for a synergistic stabilizing effect.

3,703,491

ABS RESIN COMPOSITION

Yuzi Takayama, Kamakura, Yutaka Ichimura, Yokohama, Shunsuke Minmmi, Ohtake, and Takanobu Aoyagi and Fumio Takeda, Yokohama, Japan, assignors to Nitto Chemical Industry Co., and Mitsubishi Rayon Co., Ltd., Chuo-ku, Tokyo, Japan

No Drawing. Filed Dec. 11, 1970, Ser. No. 97,331

Claims priority, application Japan, Dec. 12, 1969, 44/99,471

Int. Cl. C08f *15/40*

U.S. Cl. 260—23.7 M 5 Claims

A thermoplastic resin composition comprising (I) 20 to 70 parts by weight of a copolymer consisting of 20 to 50 parts by weight of a diene type rubbery polymer having a gel content of at least 75% and an average particle diameter of at least 0.2μ and a resinous polymer consisting of 40 to 60 parts by weight of an aromatic vinyl compound and 10 to 30 parts by weight of an unsaturated aliphatic nitrile compound, the proportion of said resinous polymer chemically bonded to the above-mentioned rubbery polymer being 15 to 50 parts by weight per 100 parts by weight of the rubbery polymer, the specific viscosity of the remaining unbonded resinous polymer being 0.5 to 0.9, (II) 30 to 80 parts by weight of a polymer having a specific viscosity of 0.45 to 0.9 which comprises 65 to 85 parts by weight of an aromatic vinyl compound and 35 to 15 parts by weight of an unsaturated aliphatic nitrile compound, (III) 0.1 to 3 parts by weight of a metal salt of a fatty acid and (IV) at least 0.01 part by weight of an organosilicon compound. Said composition is excellent in impact resistance, processability and appearance. When merely subjected to simple melt-extrusion, the composition can give a molded article which is free from such drawbacks as seen in conventional molded articles.

3,703,492

PROCESS FOR THE PREPARATION OF AQUEOUS EMULSIONS OF WATER-RESISTANT VINYL ACETATE-ETHYLENE COPOLYMERS

Shiro Masuda, Takashi Ohkubo, and Yu Furukawa, Niigata, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Apr. 21, 1970, Ser. No. 30,574

Claims priority, application Japan, Apr. 21, 1969, 44/30,253

Int. Cl. C09j *3/26*

U.S. Cl. 260—27 EV 14 Claims

A process for the production of ethylene-vinyl acetate copolymer emulsions comprising copolymerizing vinyl acetate and ethylene in the presence of rosin at a temperature not exceeding 65° C. and at a pressure of 10–100 kg./cm.² gauge.

3,703,493

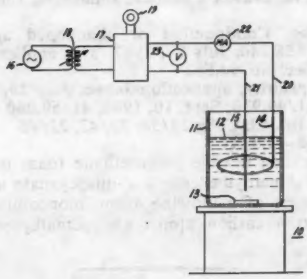
PREPARATION OF POLYAMIDE-ACID SOLUTION IN AQUEOUS TERTIARY AMINE

Fred Holub, 163 Birch Lane, Scotia, N.Y. 12302

Original application May 5, 1966, Ser. No. 548,000, now Patent No. 3,507,765, dated Apr. 21, 1970. Divided and this application July 1, 1969, Ser. No. 870,861

Int. Cl. C08g *20/32*

U.S. Cl. 260—29.2 N 13 Claims



Polyamide-acid solutions are made by forming in water an admixture of about equimolar dianhydride and diamine, and a tertiary amine and optionally a secondary amine, at temperatures below 40° C. to yield solutions substantially free of imide groups. Tertiary amines include pyridine, dimethylethanolamine, and N,N,N',N'-tetramethylbutanediamine. The product may be cast coated or electrodeposited and cured by heating at 125° C. to 300° C. to produce insulative films.

3,703,494

RESOLE VARNISHES WHEREIN PHENOL IS ALKYLATED WITH A DICYCLOPENTADIENE-CONTAINING MIXTURE AND THEN CONDENSED WITH FORMALDEHYDE TO PRODUCE THE RESOLE

George J. Anderson, Wilbraham, and Ronald H. Dahms, Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Continuation-in-part of application Ser. No. 747,437, July 25, 1968. This application Mar. 1, 1971, Ser. No. 119,898

Int. Cl. C08g *5/06;* C09d *3/54*

U.S. Cl. 260—29.3 9 Claims

Varnishes of resole resins in largely non-aqueous organic solvents, especially lower alkanols, produced by first making a resole under basic aqueous conditions from formaldehyde and a phenol which has been previously reacted under Friedel Crafts conditions with a specific mixture of dicyclopentadiene, cyclopentadiene/acyclic conjugated diene codimers, and conjugated dienes and thereafter dissolving such resole in such organic solvent. These varnishes are useful in impregnating sheets and in making laminates therefrom.

3,703,495

PROCESSABLE POLYESTER COMPOSITIONS

Winston J. Jackson, Jr., Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 811,667, Mar. 28, 1969. This application Apr. 19, 1971, Ser. No. 135,432

Int. Cl. C08g *51/50*

U.S. Cl. 260—30.6 R 10 Claims

A composition of matter comprising a polyester of a bisphenol, at least one aromatic dicarboxylic acid, and at least one aromatic hydroxy acid, blended with from about 2 to about 30 percent by weight of a triaryl phosphate, having reduced glass transition and heat-distortion temperatures, these compositions being more amenable to processing techniques.

3,703,496

HYDROLYTIC STABILIZER OF PHOSPHITE ESTERS AND USE AS EPOXY RESIN STABILIZER

James J. Hodan, Williamsville, and William L. Schall, Buffalo, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Original application Oct. 20, 1967, Ser. No. 676,709, now Patent No. 3,553,298. Divided and this application Aug. 3, 1970, Ser. No. 67,655

Int. Cl. C08g *30/14*

U.S. Cl. 260—47 EC 11 Claims

This invention is directed to a novel phosphite ester composition containing particular nitrogen-containing compounds which stabilizes the phosphite ester against hydrolysis and remains in solution, relates to novel epoxy resin compositions containing the stabilized phosphite ester composition, and relates to the stabilizing use.

3,703,497

OXIMES AS ACCELERATORS FOR THE AMINE CURING OF EPOXY RESINS

Donald Dante Carlos, Louisville, and David Alan Shimp, Lyndon, Ky., assignors to Celanese Coatings Company, New York, N.Y.

No Drawing. Filed Feb. 24, 1971, Ser. No. 118,568

Int. Cl. C08g *30/14*

U.S. Cl. 260—47 EN 9 Claims

The curing of glycidyl ethers by aliphatic amines is accelerated by oximes, giving cured resins having little or no color derived from the accelerator.

3,703,498

POLYURETHANE MILLABLE GUMS BASED ON POLYESTERS HAVING UNSATURATION IN BOTH THE ACID AND ALCOHOL PORTIONS

Thomas G. Harris, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

No Drawing. Continuation-in-part of application Ser. No. 99,709, Dec. 18, 1970. This application Aug. 16, 1971, Ser. No. 172,328

Int. Cl. C08g *17/10, 22/10*

U.S. Cl. 260—75 NK 12 Claims

Unsaturated polyester resins prepared by reacting tetrahydrophthalic anhydride or endic anhydride; optionally, an aromatic dicarboxylic acid or its equivalent; a diol having an allyl unsaturated group pendant from the diol chain; a polyoxyalkylene diol; and, optionally, an alkylene diol. The resins are chain-extended with diisocyanate to provide a polyurethane millable gum which may be cured by either a peroxide or sulfur cure to give elastomers of improved physical properties.

3,703,499

FUSIBLE THERMOSETTING POWDER RESIN AND PRODUCTION THEREOF

Martin K. Lindemann, 102 Independence Drive, Greenville, S.C. 29607

No Drawing. Filed Jan. 28, 1971, Ser. No. 110,768

Int. Cl. C08g *22/20*

U.S. Cl. 260—77.5 AT 13 Claims

Thermoplastic resin powder containing active hydrogen is mulled with a stoichiometric deficiency of liquid alkoxy monoisocyanate. This consumes the active hydrogen atoms at the surface of the powder, generating alkoxy groups at the surface surrounding a core containing unreacted active hydrogen atoms. When the powder is fused, the active hydrogen atoms remaining in the core mix with the alkoxy groups generated at the surface to induce a rapid thermosetting action after significant fusion has been completed.

3,703,500

VULCANIZATION RETARDERS OF TRIHALO-SULPHENYL-SULPHONAMIDES

Roland Nast, Dormagen, Engelbert Kühle, Bergisch Gladbach, and Manfred Abele, Porz, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

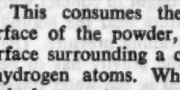
No Drawing. Filed Oct. 20, 1970, Ser. No. 82,493

Claims priority, application Germany, Nov. 15, 1969, P 19 57 484.6

Int. Cl. C08f *27/06;* C08c *11/54*

U.S. Cl. 260—79.5 B 11 Claims

Compounds of the formula



in which

R represents an alkyl radical optionally substituted by chlorine, a cycloalkyl radical, an aryl radical optionally substituted by at least one alkyl group and/or chlorine atom, an aralkyl radical or a dialkylamino group,

R_1 represents an aryl radical optionally substituted by at least one alkyl group and/or chlorine atom, and

X represents chlorine or fluorine

are used as vulcanization retarders in natural and/or synthetic rubber mixtures. One of these vulcanization retarders of the aforementioned general formula is N-phenyl - N - (trichloromethylsulphenyl) - methylsulphonamide.

3,703,501

VINYLNORBORNENE/MALEIC ANHYDRIDE COPOLYMERS AND PROCESS OF PREPARING SAME

Roger L. McCartney, Louisville, Ky., assignor to Celanese Coatings Company, New York, N.Y.

No Drawing. Filed Aug. 12, 1971, Ser. No. 171,317
Int. Cl. C08f *19/00*
U.S. Cl. 260—78.5 R 21 Claims

Unsaturated polyanhydrides, useful as curing agents for epoxy resins, are prepared by the free radical addition polymerization of vinylnorbornene and maleic anhydride, and up to about 50 weight percent of other monomers if desired.

3,703,502

PROCESS FOR ISOLATING ORGANIC COMPOUNDS DISSOLVED IN AN ORGANIC SOLVENT

Dirk J. Venderbos and Laurentius L. van Dierendonck, Geleen, Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands

Continuation of application Ser. No. 803,262, Feb. 28, 1969. This application Aug. 21, 1970, Ser. No. 66,102
Claims priority, application Netherlands, Feb. 28, 1968, 6802774
Int. Cl. C08f *47/22, 47/00*
U.S. Cl. 260—80.78 5 Claims

There is provided a process for isolating organic compounds, including polymers or copolymers from an organic solution thereof. The organic solution is introduced into a vortex chamber at a point adjacent to the periphery of the cylindrical side wall of the vortex chamber wherein it is brought in contact with a vortex flow of water of a temperature near the boiling point of the solvent under the prevailing pressure. The organic solution of which the specific gravity has to be lower than that of water is dispersed in the water phase at a point away from the interface between the liquid and the hollow core in the vortex flow. To increase the specific gravity, dissolved salts or suspended substances may be added to the water phase. The organic solution may be added to the water immediately before it enters the vortex flow or may be supplied through an axially or radially disposed feed pipe to the water phase of the vortex flow.

3,703,503

THIOUREA PSEUDOCUMENE ADDUCT

Philmore M. Scudder, Havertown, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

No Drawing. Filed Aug. 13, 1969, Ser. No. 849,878
Int. Cl. C07b *21/00*
U.S. Cl. 260—96.5 T 7 Claims

Pseudocumene (1,2,4-trimethylbenzene) will form a stable adduct with thiourea. This phenomena can be used to separate pseudocumene from a mixture of C_9 benzenoid hydrocarbons containing more than 88 weight percent of pseudocumene.

3,703,504

PROCESS FOR PRODUCING SULFURIZED OLEFINS

Andrew G. Horodysky, Beaumont, Tex., assignor to Mobil Oil Corporation

No Drawing. Filed Jan. 12, 1970, Ser. No. 2,349
Int. Cl. C07c *161/00*
U.S. Cl. 260—139 14 Claims

Olefins (e.g., isobutylene) are reacted with sulfur monochloride in the presence of a catalytic amount of methanol to form a sulfochlorinated intermediate product which is then reacted in the presence of a relatively large amount of isopropanol with an aqueous solution of sodium monosulfide derived from spent caustic soda liquors of petroleum refinery origin in producing a noncorrosive sulfurized organic product of unusually high sulfur content. The sulfurizing and dechlorinating reactant for the second stage of the process is prepared from the spent effluents (sulfurized aqueous sodium hydroxide solutions) from various hydrocarbon purification operations by preliminary treatment with hydrogen sulfide for separation of organic components and predominant or full conversion of the sodium compounds to sodium hydrosulfide followed by the addition of sodium hydroxide to the hydrosulfide solution to produce the sodium monosulfide reactant.

3,703,505

PREPARATION OF SULFURIZED OLEFINS

Andrew G. Horodysky and William Jaggers, Beaumont, Tex., assignors to Mobil Oil Corporation

No Drawing. Filed Aug. 31, 1970, Ser. No. 68,467
Int. Cl. C07c *149/00*
U.S. Cl. 260—139 10 Claims

In preparing organic sulfides by reacting olefins (e.g., butylenes) with a sulfur halide to form a sulfohalogenated intermediate which is subsequently sulfurized and dehalogenated by reaction with an aqueous solution of an alkali metal sulfide compound to form a noncorrosive organic sulfide product of high sulfur content, blackening of both the intermediate and the final product is prevented by incorporating a small amount of a base (e.g., formamide) either in the sulfohalogenation reaction mixture or shortly thereafter in the intermediate prior to the sulfurization-dehalogenation reaction.

3,703,506

ANTIBIOTICS OF AGRICULTURAL FUNGICIDES, POLYOXINS D, E, F, G AND H

Saburo Suzuki, 4–17 Hagiyama Murayama-shi; Kiyoshi Isono, N7–14, 2–17 Kirigaoka, Kita-ku; and Junsaku Nagatsu, 62–28 Kunitachi, Higashi-ku, all of Tokyo, Japan

Continuation-in-part of application Ser. No. 643,275, June 2, 1967. This application Sept. 3, 1968, Ser. No. 757,010
Claims priority, application Japan, June 6, 1966, 41/36,439; July 19, 1966, 41/47,193
Int. Cl. C07d *51/52*
U.S. Cl. 260—211.5 R 5 Claims

Polyoxins D, E, F, G and H are each a novel antibiotic to be used as an agricultural fungicide for the protection of plants.

Said polyoxins are prepared by collecting polyoxin complex containing said polyoxins from a culture medium in which has been cultivated a strain of *Streptomyces cacaoi* var. *asoensis* that is on deposit with the American Type Culture Collection (ATCC) as ATCC access numbers 19093 and 19094, and then separating said complex into each of said polyoxins.

3,703,507

PROCESS FOR THE PRODUCTION OF 9-(β-D-ARABINOFURANOSYL) ADENINE, 5'-PHOSPHATE AND SALTS THEREOF

Theodore H. Haskell, Ann Arbor, and Donald R. Watson, Pinckney, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

No Drawing. Filed Sept. 26, 1969, Ser. No. 861,485
Int. Cl. C07d *51/54*
U.S. Cl. 260—211.5 R 4 Claims

Process for the production of 9-β-D-arabinofuranosyl) adenine, 5'-phosphate and salts thereof by reacting 9-(β-D-arabinofuranosyl)adenine with phosphorus oxychloride in glacial acetic acid in the presence of a tertiary amine base at a temperature between about 0 and about 25° C. for a period that may vary from about 2 to about 20 hours.

3,703,508

PER(HALO-OXYGEN) ACID OXIDATION, PURIFICATION AND RECOVERY PROCESS AND APPARATUS THEREFOR

Allyn Harold Heit, Mount Holly, and James Norris Williamson, Marlton, N.J., assignors to Sybron Corporation, Rochester, N.Y.

Original application Apr. 8, 1968, Ser. No. 719,361, now Patent No. 3,607,694, dated Sept. 21, 1971. Divided and this application Oct. 7, 1970, Ser. No. 78,992

Int. Cl. C08b *15/00*

U.S. Cl. 260—212 1 Claim

An electrodialytic apparatus utilizing anion and cation permselective membranes and having at least one two-chamber cell for purification and at least one three-chamber cell proximal the two-chamber unit for concentration of aqueous per(halo-oxygen) acids and their salts, all anolyte chambers sharing a common anolyte stream, all catholyte chambers sharing a common catholyte stream, and at least one of the anolyte chambers of the purification and the concentration cells sharing a common anode. A multi-step process for recovering and regenerating the periodate oxidant used in preparing oxidized polysaccharides in which the primary liquor and subsequent wash liquors from the oxidized polysaccharide filter cake are circulated in the anolyte and middle chambers of the electrodialytic apparatus having two-chamber and three-chamber cells for re-oxidation and concentration respectively, the liquors having a concentration of 4 to 15 weight percent being circulated in the anolyte chambers; those liquors having a concentration of 0.5 to 5 weight percent being circulated in the middle chamber, all liquors and effluents having a concentration of less than 0.5 weight percent being passed through a strong base anion exchange resin which removes the remaining periodate or chemically reduced periodates, which are subsequently eluted by the sodium hydroxide catholyte, which in turn is circulated in the anolyte chambers of the apparatus for regeneration.

3,703,509

UNSYMMETRICAL AZIRIDINYL COMPOUNDS

Andrew Oroszlan, Elmhurst, and Giuliana C. Tesoro, Dobbs Ferry, N.Y., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

No Drawing. Original application Jan. 8, 1962, Ser. No. 165,017, now Patent No. 3,419,566, dated Dec. 31, 1968. Divided and this application Dec. 26, 1968, Ser. No. 810,880

Int. Cl. C07d *23/02, 23/06*

U.S. Cl. 260—239 E 2 Claims

Unsymmetrical aziridinyl compounds and their use as cross-linking agents for active hydrogen containing polymers in a stepwise reaction.

3,703,510

1-CARBOXYALKYL OR 1-CARBOXYALKENYL-1,4-BENZODIAZEPIN-2-ONES

James Valentine Earley, 40 Daniel Drive, Cedar Grove, N.J. 07009; Rodney Ian Fryer, 5 Eton Drive, North Caldwell, N.J. 07006; and Leo Henryk Sternbach, 10 Woodmont Road, Upper Montclair, N.J. 07043

No Drawing. Continuation-in-part of application Ser. No. 836,226, June 23, 1969. This application June 1, 1970, Ser. No. 42,532

Int. Cl. C07d *53/06*

U.S. Cl. 260—239.3 D 18 Claims

1-carboxyalkyl or 1-carboxyalkenyl-1,4-benzodiazepin-2-ones are disclosed. These benzodiazepine derivatives and their pharmaceutically acceptable salts are useful as anticonvulsants, sedatives and muscle relaxants. These compounds, particularly their basic salts, form stable aqueous solutions and thus are especially advantageous in that they are amenable to formulations suitable for injection.

3,703,511

α-AMINOBENZYL PENICILLINS

Charles Riffkin, Highland Park, Carl B. Rifino, East Brunswick, and Gilman N. Cyr, Piscataway, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

No Drawing. Filed June 6, 1969, Ser. No. 831,225

Int. Cl. C07d *91/16*

U.S. Cl. 260—239.1 3 Claims

Ampicillin trihydrate having a particle size range from about 5 microns to about 50 microns may be used to form suspensions which are stable, non-irritating, longer-acting, and may be administered in more highly concentrated form.

3,703,512

ISOPROPENYLMERCAPTO-3-ALPHA-ACYLAMINO-AZETIDIN-4-ONES

Karl Heusler, Basel, Switzerland, and Robert Burns Woodward, Cambridge, Mass., assignors to Ciba-Geigy Corporation, Summit, N.J.

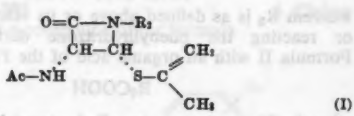
No Drawing. Filed July 15, 1969, Ser. No. 842,024

Claims priority, application Switzerland, July 23, 1968, 10,998/68; Dec. 11, 1968, 18,500/68, 18,509/68

Int. Cl. C07d *25/02*

U.S. Cl. 260—239 A 6 Claims

1 - R_2 - 2α - Isopropenylmercapto - 3α - N - Ac-amino-azetidin-4-ones of the formula



(I)

wherein R_2 reprsents a hydrogen atom or a formyl group and Ac represents the acyl radical of an organic acid, show antibacterial properties, but are primarily useful as intermediates.

3,703,513

NOVEL 3,5-DIOXOPYRAZOLIDINE DERIVATIVES

Hisao Yamamoto and Shin-Ichi Kaneko, Nishinomiya-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

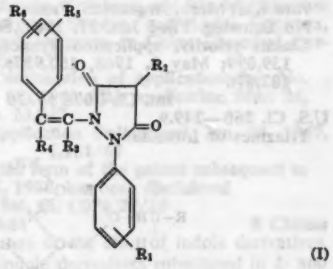
No Drawing. Filed July 24, 1969, Ser. No. 844,610

Claims priority, application Japan, Aug. 2, 1968, 43/55,051; Aug. 14, 1968, 43/58,154; Nov. 27, 1968, 43/87,107; Dec. 17, 1968, 43/92,820, 43/92,821

Int. Cl. C07d *49/04*

U.S. Cl. 260—240 D 3 Claims

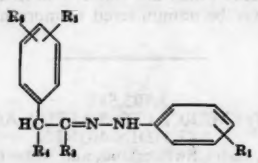
Novel 3,5-dioxopyrazolidine derivatives, having excellent anti-inflammatory effect and represented by the Formula I,



(I)

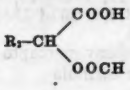
wherein R_1 signifies a hydrogen atom, a halogen atom, a nitro group, a lower alkyl group, a lower alkoxy group; R_2 signifies an alkyl group having up to 6 carbon atoms; R_3 and R_4 each signifies a hydrogen atom,

a lower alkyl group, a phenyl group or a substituted phenyl group; R_5 and R_6 each signifies a hydrogen atom, a halogen atom, a nitro group, a lower alkyl group, a lower alkoxy group, a halogenated alkyl group or an alkylated amino group; provided that R_5 and R_6 may form an optionally 5- or 6-membered heterocyclic ring together with the adjacent phenyl group, are produced by contacting a phenylhydrazone derivative represented by the Formula II,



(II)

wherein R_1, R_3, R_4, R_5 and R_6 are as defined above with a malonic acid derivative represented by the Formula III,

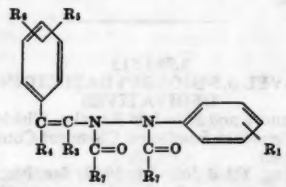


(III)

wherein R_2 is as defined above or its reactive derivatives or reacting the phenylhydrazone derivative of the Formula II with an organic acid of the Formula IV

$$R_7COOH \quad \text{(IV)}$$

wherein R_7 represents an alkyl group having up to 3 carbon atoms, or its reactive derivative, and then contacting the resulting N^1,N^2-diacylphenylhydrazine derivative of the Formula V,



(V)

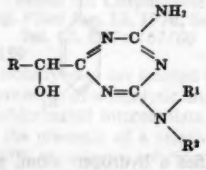
wherein R_1, R_3, R_4, R_5, R_6 and R_7 are as defined above, with a malonic acid derivative of the Formula III.

3,703,514
1,3,5-TRIAZINES

Jan Marcel Didier Aron-Samuel, 116 Rue Carnot, Suresnes, France, and Jean Jacques Sterne, 17 Boulevard Karl Marx, Argenteuil, France

No Drawing. Filed Jan. 27, 1969, Ser. No. 794,845
Claims priority, application France, Feb. 8, 1968, 139,099; May 8, 1968, 150,937; Dec. 31, 1968, 182,676
Int. Cl. C07d *55/20*
U.S. Cl. 260—249.9 **3 Claims**

Triazines of formula:



(I)

wherein R is hydrogen, an alkyl radical, a methylenedioxyphenyl radical or a phenyl radical optionally mono-, di- or trisubstituted with halogen atoms, alkyl, haloalkyl or alkoxy radicals, and R^1 and R^2 are hydrogen, an alkyl, alkenyl, cycloalkyl, dialkylaminoalkyl, piperidinoalkyl or morpholinoalkyl radical, one of substituents R^1 and R^2 being other than hydrogen or an alkyl radical when the other is itself hydrogen or an alkyl radical, or R^1 and R^2, together with the nitrogen atom to which they are attached, form a heterocycle or a C-alkylsubstituted heterocycle including, as second heteroatom, a nitrogen atom which carries an alkyl, alkenyl, hydroxyalkyl, phenyl or substituted phenyl radical, and their salts, have an activity on the central nervous system.

3,703,515
2-(DIHALONITROMETHYL) QUINOXALINES

Wilson F. Gum, Jr., and Christian T. Goralski, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Dec. 2, 1970, Ser. No. 94,625
Int. Cl. C07d *51/78*
U.S. Cl. 260—250 R **9 Claims**

New 2-(dihalonitromethyl)quinoxalines are prepared by reacting a 2-(nitromethyl)quinoxaline with dilute hypochloride or hypobromite at ca. room temperature. The 2-(nitromethyl)quinoxaline reactant may have methyl-, methoxyl-, ethyl-, ethoxyl-, trifluoromethyl-, carboxylate-, or halo-substitution in the 6- and 7-positions in the carbocyclic ring. The compounds have antimicrobial activity and are useful as germicides.

3,703,516
7-ALKYL-2,5-DISUBSTITUTED-7H-PYRROLO[2,3-d] PYRIMIDINE-6-CARBONITRILES

Dong H. Kim, Wayne, and Arthur A. Santilli, Havertown, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Original application Aug. 14, 1968, Ser. No. 752,486, now Patent No. 3,575,977, dated Apr. 20, 1971. Divided and this application July 15, 1970, Ser. No. 55,239
Int. Cl. C07d *51/46*
U.S. Cl. 260—256.5 R **2 Claims**

The disclosure is directed to 7-alkyl-2,5,6-trisubstituted 7H-pyrrolo[2,3-*d*]pyrimidines and to the 4 - [(cyanomethyl)alkylamino] - 2 - substituted - 5 - pyrimidine carboxylic acid esters which are intermediates in their production. The compounds have central nervous system activity as depressants. A representative compound is 7-methyl - 2 - phenyl - 5 - (p-tolylsulfonyl)-7H-pyrrolo-[2,3-*d*]pyrimidine-6-carbonitrile.

3,703,517
4-[(CARBOXYALKYL)AMINO]-5-PYRIMIDINE-CARBOXYLIC ACID ESTERS

Dong H. Kim, Wayne, and Arthur A. Santilli, Havertown, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Original application Aug. 14, 1968, Ser. No. 752,487, now Patent No. 3,641,028, dated Feb. 8, 1972. Divided and this application May 14, 1971, Ser. No. 143,612
Int. Cl. C07d *51/42*
U.S. Cl. 260—256.4 N **2 Claims**

The disclosure is directed to 5 - hydroxy - 7H-pyrrolo [2,3-*d*]pyrimidine-6-carboxylic acid esters and to 4-[(carboxyalkyl)amino]-5-pyrimidinecarboxylic acid esters. All these compounds have central nervous system activity as depressants while the latter compounds may also be used in the preparation of the former compounds.

3,703,518

METHOD FOR PRODUCING β-AMINO-CROTONAMIDE

Takeshi Inoi, Yokohama-shi, Koji Sueyoshi, Minamata-shi, Masahiro Fujii, Kawasaki-shi, Kenjiro Shoji, Yokohama-shi, and Akio Shudo, Takayoshi Yoshizaki, and Yutaka Matsuo, Minamata-shi, Japan, assignors to Chisso Corporation, Osaka, Japan

No Drawing. Filed July 15, 1970, Ser. No. 55,214

Claims priority, application Japan, July 28, 1969, 44/59,502; May 7, 1970, 45/38,828

Int. Cl. C07c *103/00*

U.S. Cl. 260—561 N 15 Claims

β-Aminocrotonamide having a high purity can be produced with a good yield by a simple process by reacting diketene with ammonia in the presence or in the absence of a specified solvent, cooling the resultant reaction mixture containing an oily reaction product, in the presence of said solvent, uniformly under stirring, followed by a crystallization treatment to precipitate crystals of β-aminocrotonamide and separating and recovering the resultant crystals. The yield is further improved to a quantitative value by introducing the reactants simultaneously into said solvent and further by adopting a molar ratio of one mol of diketene to two or more mols of ammonia in the reaction.

3,703,519

PIPERAZINIUM MONO(ACETYLSALICYLATE)

Edward Henderson, 200 Central Park S., New York, N.Y. 10019

No Drawing. Filed July 15, 1970, Ser. No. 55,269

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 R 1 Claim

Piperazinium mono(acetylsalicylate), useful for its analgesic, anti-pyretic, and anti-inflammatory effects, and the method of making it by admixture of ether solutions of acetylsalicylic acid and piperazine.

3,703,520

ADDUCTS OF ETHYLENE CARBONATE AND TRIETHYLENEDIAMINE

Peter S. Carleton, Branford, and William J. Farrissey, Jr., North Branford, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Oct. 6, 1970, Ser. No. 78,567

Int. Cl. C07d *51/70*

U.S. Cl. 260—268 T 3 Claims

Novel catalytic compositions are disclosed which are the monohydrate and unhydrated adducts respectively of substantially equimolar proportions of ethylene carbonate and triethylenediamine. The adducts are useful organic isocyanate trimerization catalysts.

3,703,521

METHOD FOR THE PREPARATION OF STABLE 4-FLUOROPYRIDINE SALTS

Max M. Boudakian, Pittsford, N.Y., assignor to Olin Corporation

No Drawing. Filed Mar. 22, 1971, Ser. No. 127,039

Int. Cl. C07d *31/26*

U.S. Cl. 260—290 HL 9 Claims

This invention relates to a novel integrated route to selected stable salt adducts of 4-fluoropyridine and substituted 4-fluoropyridines in high yield by the diazotization and fluorination of selected 4-aminopyridines to form the respective 4-fluoropyridine followed by combination with the desired stabilizer in an organic medium to form the respective 4-fluoropyridine salt.

3,703,522

CARBOSTYRIL DERIVATIVES

Janis Plostnieks, Philadelphia, Pa., assignor to McNeil Laboratories, Inc.

No Drawing. Original application Mar. 30, 1967, Ser. No. 626,982, now Patent No. 3,575,984. Divided and this application Mar. 27, 1970, Ser. No. 24,471

Int. Cl. C07d *33/52*

U.S. Cl. 260—288 R 3 Claims

The compounds herein are 3,4-dihydro-4-methyl-4-phenyl-6-chloro-carbostyril derivatives, useful for their various pharmacological activities, such as anti-inflammatory, hypotensive and central nervous system depressant activities. Also included herein is 4'-chloro-β-methylcinnamanilide, useful in the synthesis of the subject carbostyrils.

3,703,523

TROPANOL ESTERS OF ALPHA-PHENYL-ALPHA-CYCLOPENTYL-ACETIC ACID

Gerhard Walther, Ingelheim am Rhein, Rudolf Bauer, Wiesbaden, and Werner Schulz and Walther Sirrenberg, Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhein, Germany

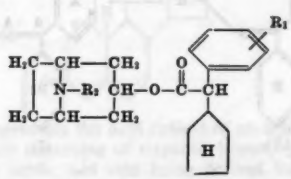
No Drawing. Filed May 26, 1971, Ser. No. 147,206

Claims priority, application Germany, June 1, 1970, P 20 26 661.9

Int. Cl. C07d *43/06*

U.S. Cl. 260—292 6 Claims

A racemate of a compound of the formula



wherein

R_1 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halogen, and

R_2 is hydrogen, alkyl of 2 to 5 carbon atoms, cycloalkyl of 3 to 6 carbon atoms or, when R_1 is other than hydrogen, also methyl,

optically active components of said racemates, quaternary ammonium salts of said racemates or optically active components, and non-toxic acid addition salts of said racemates or optically active components; the compounds and their salts are useful as anticholinergics.

3,703,524

2-AROYL-3-AMINOALKOXY INDOLES

Arne Elof Braendstroem, Goteborg, and Stig Ake Ingemar Carlsson, Moelnlycke, Sweden, and Andre Gagneux, Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Continuation of application Ser. No. 699,289, Jan. 22, 1968. This application Mar. 26, 1970, Ser. No. 23,047

Claims priority, application Switzerland, Jan. 25, 1967, 1,131/67

The portion of the term of the patent subsequent to Apr. 28, 1988, has been disclaimed

Int. Cl. C07d *29/26*

U.S. Cl. 260—293.61 8 Claims

The compounds are of the class of indole derivatives, more particularly indole derivatives substituted in 2- and 3-positions and acid addition salts thereof. The compounds are useful as analgesic, anti-inflammatory, antitussive, tranquilizing, anti-allergic and anaesthesia-potentiating agents. An illustrative embodiment is 2-benzoyl-3-(2-pyrrolidinoethoxy)indole.

3,703,525
TRIAZOLO[1,5-a][1,4]BENZODIAZEPINE DERIVATIVES

Hiroyuki Tawada, Kyoto, and Kanji Meguro and Yutaka Kuwada, Hyogo, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

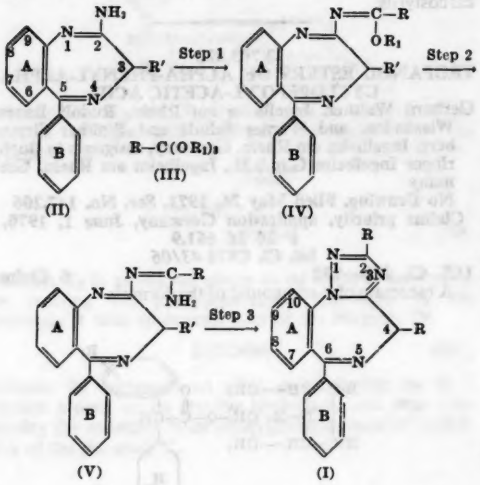
No Drawing. Filed Nov. 16, 1970, Ser. No. 90,139

Claims priority, application Japan, Nov. 15, 1969, 44/91,720

Int. Cl. C07d *53/06, 57/02*

U.S. Cl. 260—308 R **9 Claims**

s-Triazolo [1,5-a][1,4] benzodiazepine derivatives are produced by the following process:



Compounds I, IV and V, 4 or 5 N-oxides thereof and acid salts thereof are active central nervous system agents.

3,703,526
NOVEL 3-(3,5-DICHLOROPHENYL)OXAZOLIDINE-2,4-DIONE DERIVATIVES

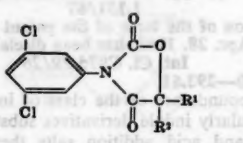
Katsumi Sato and Takashi Nakamura, Hiratsuka, Masaru Nakamura, Atsuki, Kazuo Hirasawa, Fuchuu, Matsuo Hamada, Yokohama, Kenzi Takahashi, Hiratsuka, Masaaki Yashima, Atsuki, Toshiaki Ozaki and Sigeo Yamamoto, Toyonaka, Tadashi Ooishi, Minoo, Akira Fujinami, Ashiya, Fukashi Horiuchi, Takatsuki, and Katsuji Nodera, Nishinomiya, Japan, assignors to Sumitomo Chemical Co., Ltd., and Hokko Chemical Industry Co., Ltd.

No Drawing. Continuation-in-part of abandoned application Ser. No. 779,277, Nov. 26, 1968. This application Nov. 16, 1970, Ser. No. 90,160

Int. Cl. C07d *85/34*

U.S. Cl. 260—307 B **4 Claims**

An oxazolidinedione of the formula:



wherein R^1 and R^2 are each a hydrogen atom or a lower alkyl group, is prepared by reacting 3,5-dichlorophenyl isocyanate with alkyl α-hydroxyalkanoate in the presence of a tertiary organic amine or alternatively reacting 3,5-dichloroaniline, dialkyl carbonate anda lkyl α-hydroxy-alkanoate in the presence of an alkali metal alkoxide. The oxazolidinedione is useful as an anti-fungal agent against a variety of phytopathogenic fungi.

3,703,527
PREPARATION OF MANNICH-BASES

Gabriel Saucy, Essex Fells, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Continuation-in-part of application Ser. No. 679,989, Nov. 2, 1967, now Patent No. 3,544,598, which is a continuation-in-part of application Ser. No. 633,730, Apr. 26, 1967, now abandoned, which is a continuation-in-part of application Ser. No. 604,124, Dec. 23, 1966, now abandoned, which in turn is a continuation-in-part of application Ser. No. 549,816, May 13, 1966, now abandoned. This application June 4, 1969, Ser. No. 830,491

Int. Cl. C07d *85/22*

U.S. Cl. 260—307 **13 Claims**

Mannich-bases are prepared by the reaction of vinyl carbinols with manganese dioxide in the presence of primary or secondary amines. In preferred embodiments γ, δ or ε hydroxy vinyl carbinols are reacted with manganese dioxide in the presence of a secondary amine, e.g., diethylamine to form Mannich bases which are useful as intermediates in the total synthesis of steroids having valuable pharmacological properties.

3,703,528
1,2-DIPHENYL-3,5-DIOXO-4-SUBSTITUTED PYRAZOLIDINES

Silvano Casadio and Gianfranco Pala, Milan, Italy, assignors to Istituto de Angeli S.p.A., Milan, Italy

No Drawing. Filed June 12, 1970, Ser. No. 45,891

Claims priority, application Great Britain, June 27, 1969, 32,698/69

Int. Cl. C07d *49/08*

U.S. Cl. 260—310 B **2 Claims**

1,2-diphenyl-3,5-dioxopyrazolidines having a 3-methyl-2-butenyl or 4-methyl-3-pentenyl group at the 4-position. These compounds have anti-inflammatory and analgesic activity of the order of phenylbutazone, but markedly less ulcerogenic activity.

3,703,529
NITROGEN-CONTAINING TRICYCLIC COMPOUNDS

John Frederick Cavalla, Isleworth, Roy Simpson, Slough, and Alan Chapman White, Windsor, England, assignors to John Wyeth & Brother Limited, Taplow, Maidenhead, England

No Drawing. Filed Mar. 26, 1970, Ser. No. 23,055

Claims priority, application Great Britain, Mar. 31, 1969, 16,670/69

Int. Cl. C07d *27/30*

U.S. Cl. 260—326.5 B **10 Claims**

A new group of substituted indeno-[2,1-b]pyrroles useful as analgesic or anti-inflammatory agents is described. These compounds are optionally substituted at the 3a-position by lower alkyl radicals, optionally substituted at the 1-position by lower alkyl, lower alkenyl, lower alkynyl, aryl lower alkyl, cycloalkyl lower alkyl, tertiary amino lower alkyl or acyl radicals, optionally substituted at the 4-, 5-, 6- or 7-positions by lower alkoxy or hydroxyl radicals, optionally substituted at the 2-position by an oxygen atom and optionally substituted at the 8-position by an oxygen atom, or a hydroxyl or acyloxy radical.

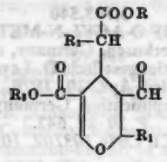
3,703,530

ALKYL - 2 - ALKYL - 2,3 - DICARBOXY-5-NORBORNENE - 7-ACETATE INTERMEDIATES FOR THE TOTAL SYNTHESIS OF ELENOLIC ACIDS AND ANALOGS THEREOF

Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Aug. 24, 1970, Ser. No. 66,557
Int. Cl. C07c *61/18*
U.S. Cl. 260—346.6 4 Claims

A total synthesis of elenolic acid, Formula XIV (R and R_2 are hydrogen, R_1 and R_3 are methyl) and the analogs thereof, of Formula XIV:



XIV

wherein R and R_2 are alkyl of 1 to 8 carbon atoms, inclusive, wherein R_1 is alkyl of 1 to 4 carbon atoms, inclusive, and wherein R_2 is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms, inclusive, is carried out by a multi-step process starting from cyclopentadiene. Compounds of Formula XIV have virucidal and hypotensive activity and can be used as hypotensive agents in mammals (U.S. Pat. 3,033,877) or as virucidal agents to decontaminate surgical instruments, hospital walls, swimming pools, or can be used for nasal washes in mammals.

3,703,531

MANUFACTURE OF BASIC NITROGEN AND HYDROXYL CONTAINING EPOXIDE RESINS

Martin Cherubim, Rheinkampeick, Horst Giehring, Hamburg, and Wilhelm Neier, Homberg, Germany, assignors to Deutsche Texaco Aktiengesellschaft (formerly Rhienpreussen A.G.), Mittelweg, Germany

No Drawing. Filed May 12, 1971, Ser. No. 142,812
Claims priority, application Germany, May 14, 1970, P 20 23 571.6
Int. Cl. C07d *1/04*
U.S. Cl. 260—348.6 2 Claims

Method of producing light colored basic nitrogen and hydroxyl containing epoxide resins having an epoxide equivalent of from 90 to 1500 comprising first contacting an alkyl primary amine of from 1 to 6 carbons with epichlorohydrin in the presence of di-secondary-butylether and second contacting the formed chlorohydrin intermediate with an alkali metal hydroxide in the presence of di-secondary-butylether and/or methyl ethyl ketone.

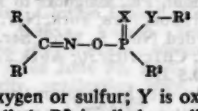
3,703,532

PHOSPHORUS CONTAINING COUMARINS

Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Original application Apr. 6, 1970, Ser. No. 26,150, now Patent No. 3,631,170. Divided and this application Jan. 11, 1971, Ser. No. 105,615
Int. Cl. C07d *7/26*
U.S. Cl. 260—343.2 R 3 Claims

Compounds having the formula:



in which X is oxygen or sulfur; Y is oxygen or sulfur; R is alkyl; R^1 is alkyl; R^2 is alkyl or alkoxy and R^3 is a heterocyclic group, and their use as insecticides and acaricides are disclosed.

3,703,533

PROCESS FOR THE MANUFACTURE OF 1,4-DIHALOGENANTHRAQUINONES

Maurice Grelat, Bettingen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 724,615, Apr. 26, 1968. This application May 25, 1971, Ser. No. 146,851
Claims priority, application Switzerland, June 12, 1967, 8,268/67
Int. Cl. C09b *1/00*
U.S. Cl. 260—384 10 Claims

A process for the manufacture of 1,4-dihalogenanthraquinones, wherein leucoquinizarine is treated in a first stage with a halogenating agent until six halogen atoms have been absorbed into the molecule, and the hexahalogeno derivative thus obtained is hydrolyzed in a second stage.

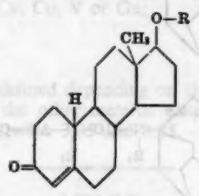
3,703,534

19-NORTESTOSTERONE ESTERS

Silvano Casadio and Gianfranco Pala, Milan, Italy, assignors to Istituto de Angeli S.p.A., Milan, Italy

No Drawing. Filed Nov. 25, 1970, Ser. No. 92,847
Int. Cl. C07c *169/22*
U.S. Cl. 260—397.4 5 Claims

There are provided novel esters of 19-nortestosterone having valuable anabolic activity. The esters have the general formula



in which R represents the acyl radical of an acid selected from the group consisting of terpenic, homoterpenic and terpenylacetic acids, said acid being derived from a terpene selected from the group consisting of *a,β*-saturated mono- and sesqui-terpenes containing 1–3 2-methyl-but-2-ene units.

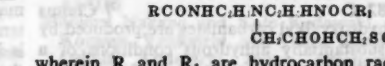
3,703,535

DIAMIDO AMINO SULFONATES AND METHODS FOR PREPARING SAME

Hans S. Mannheimer, 23 Haines Cove Drive, Toms River, N.J. 08753

No Drawing. Filed Apr. 30, 1971, Ser. No. 139,279
Int. Cl. C07c *143/90*
U.S. Cl. 260—401 9 Claims

Novel compounds of the formula:



wherein R and R_1 are hydrocarbon radicals; X is an alkali metal, or equivalent cation. They are produced by reacting hydroxy propane sultone with certain diamido derivatives of diethylene triamine.

3,703,536

PREPARATION OF OIL-SOLUBLE BORON DERIVATIVES OF AN ALKYLENE POLYAMINE-SUBSTITUTED PHENOL-FORMALDEHYDE ADDITION PRODUCT

Edmund J. Piasek, Chicago, Ill., Robert E. Karll, Munster, Ind., and Richard J. Lee, Park Forest, Ill., assignors to Standard Oil Company, Chicago, Ill.

No Drawing. Filed Nov. 24, 1967, Ser. No. 685,254
Int. Cl. C07f *5/04*
U.S. Cl. 260—462 R 4 Claims

Complex substituted alkylene polyamines such as di (alkenylsuccinimide) of N_1,N_3 symmetrical bis(amino-polyazalkylene) ureas and oil-soluble products derived

by the reaction of p-alkylphenols, formaldehyde and alkylene polyamines that react with boric acid in oil solution either with low boric acid utilization efficiency or react to form a hazy product whose haze cannot be removed by filtration are readily converted to the desired oil solution of boron and nitrogen containing products by first preparing an oil solution of super boron containing product of the complex substituted alkylene polyamine, combining the oil solution of super boron containing product with oil solution of the complex substituted alkylene polyamine and equilibrating the resulting mixture to a uniform boron to nitrogen content throughout.

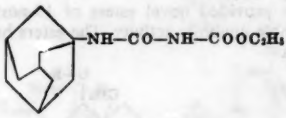
3,703,537

ADAMANTYL UREA DERIVATIVES

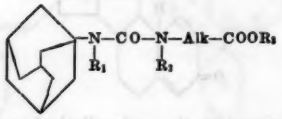
Carl Richter, Kurt Pluss, and Georg Feth, Schaffhausen, Switzerland, assignors to Cilag-Chemie, A.G.

No Drawing. Filed Oct. 28, 1969, Ser. No. 874,084
Int. Cl. C07c *127/16, 127/18, 127/20*
U.S. Cl. 260—468 B 11 Claims

Compounds useful as antiviral agents defined by the formulas:



and



wherein Alk is alkylene, R_1 and R_2 are each hydrogen or lower alkyl, and R_3 is hydrogen or a variously defined ester moiety.

3,703,538

PRODUCTION OF ANHYDROUS β-HYDROXYALKYL CARBAMATES

John D. Malkemus, Austin, Tex., and John B. Bell, Wyckoff, N.J., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

No Drawing. Continuation of application Ser. No. 516,144, Dec. 23, 1965. This application Feb. 3, 1969, Ser. No. 796,206
Int. Cl. C07d *125/04*
U.S. Cl. 260—482 C 7 Claims

Anhydrous β-hydroxyalkyl carbamates are produced by reaction under substantially anhydrous conditions of a cyclic alkylene carbonate with ammonia in the presence of a β-hydroxyalkyl carbamate solvent which causes the reaction to be initiated at about atmospheric pressures.

3,703,539

PREPARATION OF ESTERS OF UNSATURATED MONOCARBOXYLIC ACIDS

Bart A. Di Liddo, Seven Hills, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Continuation of abandoned application Ser. No. 627,476, Mar. 31, 1967. This application Apr. 7, 1971, Ser. No. 132,154
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 R 8 Claims

A process is disclosed for preparing simple, polymerizable esters of unsaturated monocarboxylic acids by effecting release of the desired ester by means of a vacuum distillation-disproportionation of the desired ester from a complex sulfate mixture containing the novel monosulfate and disulfate ester-salts of the desired ester. The sulfate mixture is prepared by reaction under essentially anhydrous conditions of an alpha-monoolefin containing up to five carbon atoms with an unsaturated monocarboxylic acid containing up to four carbon atoms in the presence of an excess of anhydrous sulfuric acid. Ethyl acrylate may thus be prepared from ethylene, glacial acrylic acid and concentrated sulfuric acid.

3,703,540

PREPARATION OF O-ACYL-N-METHYLOL-AMIDES

Erwin Muller, Leverkusen, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Apr. 20, 1970, Ser. No. 30,262
Claims priority, application Germany, May 30, 1969, P 19 27 642.7
Int. Cl. C07c *103/02, 103/60*
U.S. Cl. 260—490 4 Claims

Preparation of the title products and corresponding urethanes by reacting (1) a compound containing at least one group of the formula

$$—CO—NR—CH_2—OR'$$

wherein R is hydrogen, alkyl, alkenyl, cycloalkyl or together with the free valency of the carbonyl groups represents $—(CH_2)_5—$ and R' is alkyl or alkenyl, is heated with (2) acetic anhydride or propionic anhydride at a temperature of from about 100 to about 170° C. Typical examples of (1) include N-methylol alkyl and alkenyl ethers of acrylamide and methacrylamide.

3,703,541

PROCESS FOR THE PRODUCTION OF 3-HYDROXY-2,2,4-TRIMETHYLPENTYL ISOBUTYRATE

Itaru Takasu, Oi-machi, and Takaaki Sasaki and Akira Yamamoto, Arai, Japan, assignors to Daicel Ltd., Osaka, Japan

No Drawing. Filed Apr. 16, 1970, Ser. No. 29,262
Claims priority, application Japan, Apr. 24, 1969, 44/31,857
Int. Cl. C07c *67/10*
U.S. Cl. 260—494 4 Claims

A process for producing 3-hydroxy-2,2,4-trimethylpentyl isobutyrate in which isobutyraldehyde is condensed by employing as a catalyst an alkali metal salt of a monohydric or polyhydric phenol which is either unsubstituted or has hydrocarbon or phenolic substituents in the aromatic nucleus thereof. The reaction is carried out at a temperature of 70°–100° C. and the catalyst concentration is in the range of from 0.3% to 5% by weight based on the weight of the aldehyde. The water content of the starting aldehyde is less than 5000 p.p.m.

3,703,542

HYDROXAMIC ACID DERIVATIVES OF 1-AMINOCYCLOHEXANECARBOXYLIC ACID

Harvey E. Alburn, West Chester, Donald E. Clark, Norristown, Norman H. Grant, Wynnewood, and Milton Lapidus, Rosemont, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Nov. 5, 1969, Ser. No. 874,382
Int. Cl. C07c *103/30;* A61k *27/00*
U.S. Cl. 260—500.5 H 3 Claims

The compounds are hydroxamic acids of alicyclic amino acids, and esters of said compounds, all of which have valuable pharmacodynamic properties in that they relieve hyperglycemia in warm-blooded animals.

3,703,543
HYDROXAMIC ACIDS OF ALICYCLIC AMINO ACIDS

Harvey E. Alburn, West Chester, Donald E. Clark, Norristown, Norman H. Grant, Wynnewood, and Milton Lapidus, Rosemont, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Nov. 5, 1969, Ser. No. 874,381
Int. Cl. C07c *103/30;* A61k *27/00*
U.S. Cl. 260—500.5 H 2 Claims

The compounds are hydroxamic acids of alicyclic amino acids, and esters of said compounds, all of which have valuable pharmacodynamic properties in that they suppress the immune response in warm-blooded animals.

3,703,544
PROCESS FOR PREPARING THE TRIS(HYDROXYMETHYL)-AMINOMETHANE SALT OF PGE_2

Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Continuation-in-part of application Ser. No. 42,458, June 1, 1970. This application May 10, 1971, Ser. No. 142,019
Int. Cl. C07c *91/02*
U.S. Cl. 260—501.17 3 Claims

Free flowing crystals of the tris(hydroxymethyl)aminomethane salts of PGE_2 and $PGF_{2\alpha}$, and processes for producing those, are disclosed. Those crystals are useful for the same pharmacological and medical purposes as PGE_2 and $PGF_{2\alpha}$, and are also useful as a means for purifying PGE_2 and $PGF_{2\alpha}$.

3,703,545
POLYALKYLENEPOLYAMINES WITH N-(2-HYDROXY-3-SULFOPROPYL) GROUPS

Avis L. McCrary, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed July 2, 1970, Ser. No. 52,101
Int. Cl. C07c *143/14;* C07f *15/02;* A01n *7/00*
U.S. Cl. 260—513 N 5 Claims

Polyalkylenepolyamines wherein the amino hydrogen atoms have been replaced by carboxymethyl and 2-hydroxy-3-sulfopropyl groups are effective iron chelating agents useful for promoting plant growth. Those compounds where most of the substituents are 2-hydroxy-3-sulfopropyl groups have superior iron chelating capacity, particularly at high pH levels.

3,703,546
PREPARATION OF 3-AMINO-2,5-DICHLOROBENZOIC ACID

Joseph Michael Faraday Leaper, Lansdale, and Harvey Peter John Raman, Philadelphia, Pa., assignors to Amchem Products, Inc., Ambler, Pa.

No Drawing. Filed Oct. 24, 1968, Ser. No. 770,393
Int. Cl. C07c *101/54*
U.S. Cl. 260—518 A 3 Claims

3-amino-2,5-dichlorobenzoic acid is prepared in high yield by chlorinating benzoylchloride and esterifying the resulting mixture, separating the desired 2,5-dichloro isomer from the mixture by freeze crystallization, nitrating and isolating 3-nitro-2,5-dichlorobenzoic acid from the mixture of nitro isomers by acid hydrolysis and treating with a reducing agent.

3,703,547
METHOD OF PREPARING PHTHALIC ACIDS

Luigi Lugo, Milan, Giorgio Gualdi, Verona, and Cesare Reni, Busto Arsizio, Varese, Italy, assignors to Societá Italiana Resine S.p.A., Milan, Italy

No Drawing. Filed June 30, 1970, Ser. No. 51,318
Claims priority, application Italy, July 7, 1969, 19,282/69
Int. Cl. C07c *63/02*
U.S. Cl. 260—524 R 5 Claims

A process for the catalytic oxidation of p-xylene to terephthalic acid, consisting in partially oxidising the p-xylene in an initial stage of the reaction, in the presence of metallic catalysts, and completing the oxidation reaction in a second stage carried out at a lower temperature than the first, in the presence of activators consisting of organic substances containing one or more keto groups in the molecule.

3,703,548
PROCESS FOR THE PRODUCTION OF UNSATURATED ACIDS

Makoto Honda, Tokyo, and Kyugo Tanaka and Itaru Watanabe, Kanagawa, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed Mar. 2, 1971, Ser. No. 120,342
Claims priority, application Japan, Mar. 17, 1970, 45/22,420
Int. Cl. C07c *57/04*
U.S. Cl. 260—530 N 3 Claims

Unsaturated fatty acids, particularly acrylic acid or methacrylic acid are prepared by oxidizing unsaturated aliphatic aldehydes, particularly acrolein or methacrolein, in gaseous phase with molecular oxygen-containing gas in the presence of a catalyst of

$$Mo_aTl_bX_cO_d$$

where
X is Re, Hg, Cu, Co, V or Ga;
a=1;
b=0.01–0.5;
c=0–1.0; and
d=a number defined depending on the oxidation state of Mo and the other metallic elements, and within the range between 3.05 and 4.85.

3,703,549
PRODUCTION OF DICARBOXYLIC ACIDS

Bertram Yeomans, Hessle, England, assignor to BP Chemicals Limited, London, England

No Drawing. Filed Sept. 8, 1970, Ser. No. 70,527
Claims priority, application Great Britain, Sept. 11, 1969, 44,850/69
Int. Cl. C07c *51/00, 51/14*
U.S. Cl. 260—533 A 14 Claims

Di-neo acids are produced by treating a mono-neo acid containing at least 10 carbon atoms and no tertiary hydrogen atoms with strong acid.

3,703,550
PROCESS FOR PREPARING UNSATURATED ALDEHYDES AND UNSATURATED CARBOXYLIC ACIDS

Mamoru Nakano and Koju Kadowaki, Amimachi, Isao Komuro, Yokkaichi, and Takeo Koshikawa and Bunzi Oshida, Amimachi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

No Drawing. Continuation-in-part of abandoned application Ser. No. 699,307, Jan. 22, 1968. This application Dec. 29, 1970, Ser. No. 102,501
Int. Cl. C07c *51/32, 57/04*
U.S. Cl. 260—533 N 4 Claims

In the process for preparing unsaturated compounds selected from unsaturated aldehydes and unsaturated carboxylic acids which comprises contacting an α-olefin in the vapor phase with molecular oxygen at a temperature of 250–550° C. in the presence of a solid catalyst, the improvement wherein the solid catalyst consists essentially of the elements of (i) molybdenum, (ii) tin, (iii) phosphorus, (iv) tellurium, (v) iron and (vi) oxygen, said elements (i) to (v) being present in the catalyst in an atomic ratio expressed by the following formula:

$$(Mo)_{12}(Te)_a(P)_b(Sn)_c(Fe)_d$$

wherein a is from 0.2 to 12, b is from 0.2 to 24, c is from 0.2 to 24, and d is from 0.2 to 24.

3,703,551

PROCESS FOR THE CONVERSION OF OLEFINS TO UNSATURATED ALDEHYDES AND ACIDS

Leon B. Levy, Nueces, Tex., assignor to Celanese Corporation, New York, N.Y.

No Drawing. Filed Mar. 16, 1971, Ser. No. 124,939

Int. Cl. C07c *57/04, 47/22*

U.S. Cl. 260—533 N 7 Claims

This disclosure relates to the oxidation of olefins to unsaturated aldehydes and unsaturated acids such as the conversion of propylene to acrolein and acrylic acid in the vapor phase and at an elevated temperature in the presence of a catalyst comprising phosphorus, molybdenum and tellurium dioxide supported with rhenium on an inert support and methods for preparation of the catalyst.

3,703,552

N-PHENYL-N'-SALICYLOYL-PHENYLENE DIAMINES

Ronald B. Spacht, 1750 Tannery Circle Road, Hudson, Ohio 44236

No Drawing. Original application Oct. 2, 1967, Ser. No. 672,028, now Patent No. 3,558,552. Divided and this application May 21, 1970, Ser. No. 48,598

Int. Cl. C07c *103/19, 103/26, 103/74*

U.S. Cl. 260—559 S 3 Claims

Certain salicyloyl derivatives such as N-phenyl-N'-salicyloyl-p-phenylenediamine and N-phenyl-N'-3-tertiary-butyl salicyloyl-p-phenylenediamine as antioxidants for oxidizable polymers.

3,703,553

DIMERIZATION OF 2-AMINOMETHYL-1,3-BUTADIENE

Griffin D. Jones and Nancy B. Tefertiller, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Sept. 10, 1969, Ser. No. 856,839

Int. Cl. C07c *87/38*

U.S. Cl. 260—563 R 8 Claims

The cyclic dimer of 2-aminomethyl-1,3-butadiene is formed by reacting in solution the monomer with a Brönsted acid. A free-radical scavenger, such as hydroquinone, is preferably added as a polymerization inhibitor. The cyclic dimer is useful as an epoxy curing agent.

3,703,554

TERPENYLAMINO ETHERS AND THIOETHERS

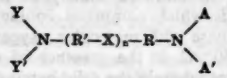
Carl Bordenca, Ponte Vedra Beach, Fla., assignor to SCM Corporation, Cleveland, Ohio

No Drawing. Filed July 22, 1969, Ser. No. 851,770

Int. Cl. C07c *87/24, 93/10*

U.S. Cl. 260—583 EE 10 Claims

Described are a novel class of diamines of the formula:



I.

where Y and Y' are terpenyl, R' and R are lower allylene, A and A' are like or dissimilar lower alkyl, X is sulfur or oxygen, and *n* is an integer of from 1 to 3. Also described are stable salts thereof.

Novel compounds and compositions containing them are advantageous in that they exhibit phytocidal activity when employed in minute quantities and are nontoxic to warm-blooded animals and man. Compounds and compositions are phytocidally effective against aquatic and terrestrial plant species and are often effective against aquatic weeds in concentrations below 1 part per million.

3,703,555

HYDROLYSIS OF IMINES AND RESULTANT PRODUCTS

Ernest A. Zuech, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Original application Jan. 29, 1965, Ser. No. 429,117, now Patent No. 3,422,142, dated Jan. 14, 1969. Divided and this application Sept. 26, 1968, Ser. No. 762,990

Int. Cl. C07c *47/20*

U.S. Cl. 260—601 R 5 Claims

Imines are converted to higher molecular weight imines by reaction with a butadiene in the presence of an alkali metal amide. The initial imine must have at least one alpha hydrogen. The new imine will contain at least one 2-butenyl group in place of an alpha hydrogen in the original imine.

3,703,556

HALOGENATION OF HYDROXYARYL SULFONES

David S. Davis, West Orange, and Young K. Kim, Paterson, N.J., assignors to Witco Chemical Corporation, New York, N.Y.

No Drawing. Filed Nov. 14, 1969, Ser. No. 876,990

Int. Cl. C07c *147/10*

U.S. Cl. 260—607 A 5 Claims

Brominated or chlorinated derivatives of hydroxyaryl sulfones are produced by direct halogenation of the sulfone in carboxylic acid solvent medium, said acid having from 1 to 6 carbon atoms.

3,703,557

PROCESS FOR THE PREPARATION OF TETRAFLUOROETHYLENE BY DECHLORINATION AND DIMERIZATION OF DICHLORODIFLUOROMETHANE

Martino Vecchio, Milan, Giorgi Carraro, Saronno, and Italo Cammarata, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed June 4, 1970, Ser. No. 43,578

Claims priority, application Italy, June 4, 1969, 17,737/69

Int. Cl. C07c *21/18, 17/26*

U.S. Cl. 260—653.3 12 Claims

A process is disclosed for the preparation of tetrafluoroethylene by the dechlorination and dimerization of dichlorodifluoromethane, wherein the reaction is carried out with an amalgam of alkali or alkaline-earth metal in a reaction medium comprising at least one organic solvent.

3,703,558

PROCESS FOR PREPARING A PURE HYDROGENATED CYCLOOLEFIN

Ralph Levine, Freehold, N.J., assignor to Cities Service Company

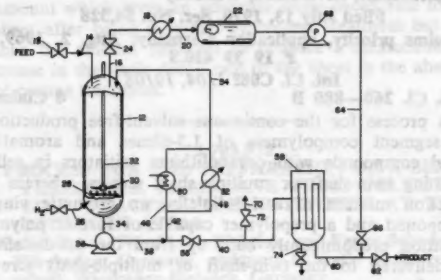
Filed Feb. 18, 1971, Ser. No. 116,325

Int. Cl. C07c *5/02, 13/02*

U.S. Cl. 260—666 P 6 Claims

A process improvement for producing high purity cyclododecane (CDA) from cyclododecatriene is disclosed wherein after the cyclododecane (as the hydrogen-

ation zone reaction product) and the hydrogenation catalyst is filtered to separate the catalyst and purify the product, the catalyst filter cake is backflushed with a volatile



liquid alkane to the hydrogenation zone. The alkane is then volatilized and displaced by cyclododecatriene feed. Retained liquid alkane on the filter is vacuum flushed.

3,703,559

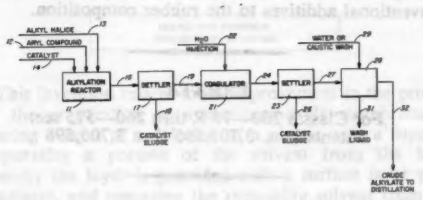
PURIFICATION OF DETERGENT ALKYLATES

Oliver C. Kerfoot, Ponca City, Okla., and George W. Duchmann, Lake Charles, La., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of application Ser. No. 742,497, July 5, 1968. This application Nov. 25, 1970, Ser. No. 92,737

Int. Cl. C07c *7/00*

U.S. Cl. 260—674 A **7 Claims**



Suspended aluminum halide catalyst sludge is removed from crude detergent alkylate by introducing a small amount of water to the detergent alkylate in order to coagulate the suspended sludge. The coagulated sludge is then separated from the detergent alkylate and the purified detergent alkylate is washed with water or alkaline solution to remove substantially all acidity or inorganic salts present in the product.

3,703,560

3,4-DIPHENYL-1-(4-HYDROXYPHENYL)-CYCLOPENTANE

Rudolf G. Griot, Florham Park, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Original application July 8, 1968, Ser. No. 743,039, now Patent No. 3,598,860. Divided and this application Feb. 24, 1971, Ser. No. 118,519

Int. Cl. C07c *39/12*

U.S. Cl. 260—619 D **1 Claim**

The invention relates to 2-[4-(3',4'-diphenylcyclopentyl)-phenoxy] lower aliphatic monocarboxylic acids and the corresponding lower alkyl esters, and to a process for their production. The compounds are useful as hypolyipidemics.

3,703,561

OLEFIN CONVERSION USING COMPLEXES OF Cu, Ag AND Au WITH ORGANOALUMINUMS

Donald H. Kubicek and Ernest A. Zuech, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Application Mar. 28, 1968, Ser. No. 717,024, now Patent No. 3,558,520, dated Jan. 26, 1971, which is a continuation-in-part of abandoned application Ser. No. 635,693, May 3, 1967. Divided and this application Sept. 17, 1970, Ser. No. 73,233

Int. Cl. C07c *3/62*

U.S. Cl. 260—683 D **11 Claims**

A process for the conversion of olefinic hydrocarbons according to the olefin reaction (e.g., the olefin disproportionation reaction) by contacting the olefinic hydrocarbon with a catalyst comprising a coordination complex of copper, silver, or gold together with an aluminum-containing adjuvant.

3,703,562

SULFONIC ACID CONTAINING ORGANOPOLYSILOXANE COMPOSITIONS

Robert C. Antonen and Gust J. Kookootsedes, Midland, and Arthur J. Field, Bay City, Mich., assignors to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed Mar. 27, 1972, Ser. No. 238,532

Int. Cl. C08f *11/04*

U.S. Cl. 260—825 **14 Claims**

Small amounts of aryl-substituted sulfonic acids are added to siloxane resins curable by the platinum catalyzed reaction of $\equiv SiCH{=}CH_2$ with $\equiv SiH$ to improve the moisture resistance of the cured resins.

3,703,563

POLYACRYLAMIDE-EPOXIDIZED AMINOPLAST-UREA CONDENSATES

Stanley A. Lipowski, Livingston, and John C. Queen, Jr., Haworth, N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

No Drawing. Filed June 21, 1971, Ser. No. 155,253

Int. Cl. C08g *45/04*

U.S. Cl. 260—836 **8 Claims**

A polymeric cationic condensate is synthesized by reacting a polyacrylamide with an epoxidized aminoplast to form a pre-condensate and then further reacting the pre-condensate with urea. The product is a stable, water soluble composition, useful in paper manufacturing applications as a pigment retention aid, to give improved dry strength, and as a pitch dispersant.

3,703,564

BIS(POLYPHENYLENE OXIDE)-ESTER BLOCK COPOLYMERS

Dwain M. White, Schenectady, N.Y., assignor to General Electric Company

No Drawing. Filed Jan. 5, 1970, Ser. No. 817

Int. Cl. C08g *33/10, 39/10*

U.S. Cl. 260—860 **9 Claims**

The invention relates to block copolymers of the A-B-A type where each A is the phenoxy residue of a poly(2,6-disubstituted-1,4-phenylene oxide) having one terminal hydroxyl per polymer molecule and B is the residue of a compound having two groups which are reactive

with the hydroxyl group of said poly(phenylene oxide). These compositions are useful in producing molded articles, films, fibers, etc., having modified properties compared to the parent poly(phenylene oxides).

3,703,565

BLENDS OF ETHYLENE POLYMERS HAVING IMPROVED STRESS CRACK RESISTANCE

Louis D. Hoblit, Williamsburg, Va., and Carl P. Strange, Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 755,831, Aug. 28, 1968, now Patent No. 3,660,530, dated May 2, 1972, which is a continuation-in-part of abandoned application Ser. No. 514,119, Dec. 15, 1965. This application Feb. 22, 1971, Ser. No. 117,819

The portion of the term of the patent subsequent to May 2, 1989, has been disclaimed

Int. Cl. C08f *29/04, 29/10*

U.S. Cl. 260—876 B **4 Claims**

Blends of ethylene polymers having improved stress crack resistance comprising a high density, high molecular weight polyethylene and a copolymeric constituent containing as an essential ingredient at least one block copolymer of polyethylene and a polymer of butene-1. A method for the preparation thereof which comprises (1) polymerizing ethylene to high density, high molecular weight polyethylene in the presence of a heterogeneous catalyst system, such as a mixture of triisobutyl aluminum and titanium tetrachloride, and a molecular weight control agent, such as hydrogen; (2) withdrawing a major part of the resulting polymer slurry from the polymerization zone; (3) introducing a gaseous alpha-olefin, such as butene-1, into the remaining portion of the still catalytically active polymer slurry and polymerizing the resulting mixture to obtain a block copolymer of polyethylene and a polymer of butene-1; and (4) admixing the withdrawn polymer slurry with the remaining polymer slurry.

3,703,566

GRAFT COPOLYMERISATION PROCESS

Edward William Duck, Southampton, John Michael Locke, Lyndhurst, and Allan John Amass, Southampton, England, assignors to The International Synthetic Rubber Company, Southampton, Hampshire, England

No Drawing. Filed July 31, 1970, Ser. No. 60,099

Claims priority, application Great Britain, Aug. 7, 1969, 39,645/69

Int. Cl. C08f *17/00, 19/04, 27/04*

U.S. Cl. 260—878 R **15 Claims**

A method of preparing a copolymer having an elastomeric hydrocarbon polymeric backbone and a plurality of side chains comprising polymerising one or more polymerisable monomers (as herein defined) in the presence of an unsaturated hydrcarbon elastomeric polymer of iodine number at most 100 and having attached thereto a plurality of alkali metal atoms. In a preferred embodiment the unsaturated hydrocarbon elastomeric copolymer having attached thereto the alkali metal atoms is one prepared by treating in the substantial absence of aromatic compounds an unstaurated hydrocarbon elastomeric polymer of iodine number at most 100 with a complex of an alkali metal hydrocarbon, wherein the hydrocarbon is saturated, and a polar compound. The unsaturated hydrocarbon elastomeric copolymer is preferably an ethylene propylene terpolymer and the polymerisable monomer(s) is/are selected from butadiene, isoprene and styrene. The products are compatible and covulcanisable with other elastomers of high unsaturation.

3,703,567

PROCESS FOR THE PRODUCTION OF SEGMENT COPOLYMERS

Hubert Sutter, Cologne, and Manfred Beck, Schildgen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 13, 1970, Ser. No. 54,328

Claims priority, application Germany, Aug. 2, 1969, P 19 39 420.8

Int. Cl. C08f *1/04, 19/08*

U.S. Cl. 260—880 B **4 Claims**

A process for the continuous solvent-free production of segment compolymers of 1,3-dienes and aromatic vinyl compounds with organolithium initiators in self-cleaning twin-shaft or multiple-shaft screws, wherein a reaction mixture of a 1,3-diolefin, an aromatic vinyl compound and a prepolymer capable of further polymerisation predominantly built up from the 1,3-diolefin, is delivered to the twin-shaft or multiple-shaft screw extruder.

3,703,568

CHLOROPRENE RUBBER COMPOSITION

Takashi Kadowaki, Kenji Itoyama, and Shoya Matsuzawa, Ohmi-machi, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Sept. 17, 1970, Ser. No. 73,174

Claims priority, application Japan, Sept. 24, 1969, 44/75,364

Int. Cl. C08f *29/12*

U.S. Cl. 260—890 **3 Claims**

Chloroprene rubber composition consisting mainly of a mixture of 100 parts by weight of chloroprene polymer and 0.1 to 20 parts by weight of polyvinyl alcohol. The chloroprene rubber composition can be used alone as an adhesive. An adhesive composition having a more excellent stability against layer separation is obtained by adding a metal oxide, and a modified phenol resin and conventional additives to the rubber composition.

ERRATA

For Classes 260—78 R thru 260—575 see:
Patents Nos. 3,703,595 thru 3,703,598

3,703,569

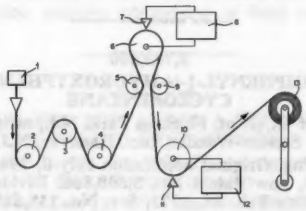
CORONA TREATMENT OF ANTISTAT CONTAINING SHEET OF ETHYLENE OR ETHYLENE COPOLYMER

Richard I. Wolkowicz, Clarksboro, N.J., assignor to Scott Paper Company, Delaware County, Pa.

Filed Mar. 23, 1970, Ser. No. 21,954

Int. Cl. B29d *7/20;* H05f *1/02*

U.S. Cl. 264—22 **4 Claims**



A method of preparing a sheet comprising thermoplastic polymeric material selected from polyethylene and

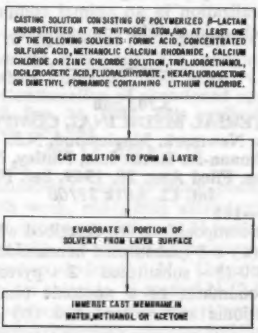
copolymers of ethylene and propylene and an antistatic agent which includes the step of subjecting the sheet to corona treatment, whereby the static decay rate of the sheet is increased. The amount of antistat is at least the amount which gives an adequate static decay rate to the sheet after being modified by corona treatment but less than the amount sufficient to produce a measurable increase in the static decay rate of the sheet in the absence of corona treatment.

3,703,570

PROCESS FOR THE PREPARATION OF A SEMIPERMEABLE MEMBRANE FROM POLYMERIZED β-LACTAM UNSUBSTITUTED AT THE NITROGEN ATOM

Walter Busch, Wiesbaden-Biebrich, and Franz Schwarzer, Wiesbaden, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Dec. 29, 1969, Ser. No. 888,929
Claims priority, application Germany, Dec. 31, 1968, P 18 17 542.3
Int. Cl. B29d 7/22, 27/04; C08g 20/10
U.S. Cl. 264—41 **7 Claims**


CASTING SOLUTION CONSISTING OF POLYMERIZED β-LACTAM UNSUBSTITUTED AT THE NITROGEN ATOM, AND AT LEAST ONE OF THE FOLLOWING SOLVENTS: FORMIC ACID, CONCENTRATED SULFURIC ACID, METHANOLIC CALCIUM RHODANIDE, CALCIUM CHLORIDE OR ZINC CHLORIDE SOLUTION, TRIFLUOROETHANOL, DICHLOROACETIC ACID, FLUORALHYDRATE, HEXAFLUOROACETONE OR DIMETHYL FORMAMIDE CONTAINING LITHIUM CHLORIDE.
CAST SOLUTION TO FORM A LAYER
EVAPORATE A PORTION OF SOLVENT FROM LAYER SURFACE
IMMERSE CAST MEMBRANE IN WATER, METHANOL OR ACETONE

This invention relates to an improvement in the process for the preparation of a semipermeable membrane by pouring a layer of a solution of a plastic onto a support, evaporating a portion of the solvent from the layer whereby the layer is provided with a surface layer poor in solvent, and removing the remaining solvent from the layer by means of a liquid which is miscible with the solvent but does not dissolve the plastic, the improvement comprising employing as the plastic at least one polyamide which is a polymerized β-lactam unsubstituted at the nitrogen atom.

3,703,571

METHOD OF CASTING RIGID FOAM TO SUPPORT A HOLLOW FLEXIBLE PLASTIC SHELL

Arthur H. Roberts, 12 Lynnwood Drive, Westbury, N.Y. 11590

Continuation of abandoned application Ser. No. 760,415, Sept. 18, 1968, which is a division of application Ser. No. 523,778, Jan. 28, 1966, now Patent No. 3,419,455, which is a continuation-in-part of applications Ser. No. 455,764, May 14, 1965, now Patent No. 3,405,026, and Ser. No. 475,989, July 30, 1965, now Patent No. 3,414,456, which in turn are continuations-in-part of abandoned application Ser. No. 22,002, Apr. 13, 1960. This application May 10, 1971, Ser. No. 142,037
Int. Cl. B29d 27/04
U.S. Cl. 264—45 **21 Claims**

Process for preparing rigid, impact-resistant article comprising a hollow outer shell component and an inner rigidifier component comprising a cellular plastics material. The article is formed by molding the hollow flexible shell component, removing the molded shell component from its mold, introducing a foamable organic plastic into the shell and allowing it to foam and solidify into a rigid

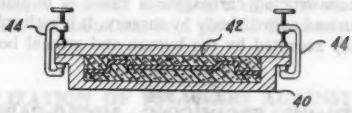
foam in contact with the entire inner surface of the flexible shell.

3,703,572

METHOD OF FORMING A MOLD AND CASTING SHALLOW ARTICLES THEREIN

Gerald J. Bellasalma, West Caldwell, N.J., assignor to Plastetics, Inc., Fairfield, N.J.

Filed Nov. 14, 1969, Ser. No. 876,859
Int. Cl. B29c 1/02, 17/04, 7/00
U.S. Cl. 264—92 **10 Claims**



A thin mold is formed from a pattern out of a thin sheet of thermoplastic synthetic resin, preferably a thermoplastic elastomer. Since this mold is too thin to be used for casting, it is backed with a cast material so that the mold comprises a thin sheet of elastomer and a removable cast backing. After the article is cast in this mold, the backing is removed. This enables the thin mold to be readily and expeditiously removed from the cast article without either damaging the article or the mold.

3,703,573

PROCESS FOR EXTRACTING COPPER, COBALT AND NICKEL VALUES FROM AQUEOUS SOLUTION

George C. Blytas, Kensington, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed Aug. 5, 1971, Ser. No. 169,423
Int. Cl. C01g 3/00, 51/00, 53/00
U.S. Cl. 423—24 **7 Claims**

4 - alkyl - 1,2-cyclohexanedione dioximes selectively extract copper, cobalt and nickel values from aqueous solutions of pH 2–9.

3,703,574

PROCESS FOR THE PREPARATION OF STABILIZERS FOR HALOGEN-CONTAINING SYNTHETIC RESINS

Andre S. van den Berg, North Beegden, Netherlands, assignor to N.V. Chemische Fabriek v/h Dr. A. Haagen, Roermond, Netherlands

No Drawing. Filed Dec. 23, 1968, Ser. No. 786,476
Claims priority, application Netherlands, Dec. 22, 1967, 6717564
Int. Cl. C01g 21/16, 21/20; C08d 11/04
U.S. Cl. 423—462 **8 Claims**

This invention relates to a process for the preparation of complex basic lead compounds to be applied as stabilizers for halogen-containing synthetic resins, in which process a suspension of lead oxide in water is reacted at increased temperatures with hydrochloric acid in the presence of a small amount of a lower aliphatic carboxylic acid, and optionally in the presence of one or more other inorganic acids and/or one or more other organic acids, and the hardly soluble reaction product formed is separated from the reaction mixture, whereby the amount of hydrochloric acid added is such that the chlorine content

of the obtained product amounts to 1.5–5.5 percent by weight.

3,703,575

RECONSTRUCTED CARTILAGINOUS TISSUE AND METHOD OF IMPLANTING IT INTO THE HUMAN OR ANIMAL BODY

Heinrich Thiele, Neue Universitaet Haus A2, Kiel, Germany

No Drawing. Original application Oct. 2, 1967, Ser. No. 671,981. Divided and this application Dec. 23, 1970, Ser. No. 101,124

Int. Cl. A61f *1/00*

U.S. Cl. 3—1 9 Claims

Tendons, cartilage tissue, nerve sheaths, and the like cartilaginous materials which are useful in surgery for replacing damaged tissue of this type and for implantation into the body consist of protein- and muco-polysaccharide-containing ionotropic gels with oriented filamentary molecules. They correspond in their structure to the histological structure of the natural tissue to be replaced and are of high mechanical stability, strength and elasticity.

The reconstructed cartilaginous tissue is implanted in the human and animal body by surgery. It is well tolerated and readily accepted by the human and animal body.

3,703,576

METHOD OF PRODUCING MICRO-CAPSULES ENCLOSING ACETYLSALICYLIC ACID THEREIN

Masao Kitajima, Yoozi Tsuneoka, and Asaji Kondo, Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 10, 1970, Ser. No. 62,410

Claims priority, application Japan, Aug. 8, 1969, 44/62,738

Int. Cl. A61j *3/07*

U.S. Cl. 424—35 10 Claims

A method for encapsulating acetylsalicylic acid which comprises dispersing acetylsalicylic acid in an organic solvent solution of a cellulose derivative, dispersing the resulting dispersion in the form of droplets in a concentrated aqueous solution of an inorganic salt and evaporating the organic solvent from the system, is disclosed.

3,703,577

4-(THIAZOLYL) PYRIDINIUM SALTS AND 4-(OXAZOLYL) PYRIDINIUM SALTS FOR LOWERING BLOOD GLUCOSE LEVELS

Victor John Bauer, Montvale, N.J., Gretchen Ellen Wiegand, Pearl River, N.Y., and Sidney Robert Safir, River Edge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 690,382, Dec. 14, 1967, which is a continuation-in-part of application Ser. No. 669,705, Sept. 22, 1967, both now abandoned. This application Mar. 22, 1971, Ser. No. 127,023

Int. Cl. A61k *27/00*

U.S. Cl. 424—263 5 Claims

Compositions containing thiazolylpyridinium salts and oxazolylpyridinium salts are described. The use of these compositions as a means for the lowering of blood glucose levels in warm-blooded animals is described.

3,703,578

TOOTH PASTE HAVING IMPROVED TOOTH CLEANING PROPERTIES

John A. Cella, Lake Forest, and William H. Schmitt, Elmhurst, Ill., assignors to Alberto-Culver Company, Melrose Park, Ill.

No Drawing. Filed Apr. 24, 1970, Ser. No. 31,789

Int. Cl. A61k *7/16*

U.S. Cl. 424—49 5 Claims

Toothpaste, of the non-self-heating type and of the type which does not liberate oxygen in the presence of water, having improved tooth cleaning properties comprising a mild abrasive agent, in major proportion based upon the weight of the solid ingredients of the toothpaste, and at least 20%, by weight, of the total of the liquid ingredients of said toothpaste, of at least one water-soluble polyoxyalkyleneglycol having a molecular weight of at least 200.

3,703,579

COMPOSITIONS FOR INHIBITING ANOMALOUS DEPOSITION AND MOBILIZATON OF CALCIUM PHOSPHATE IN ANIMAL TISSUE

James S. Widder, Springfield Township, Hamilton County, Ohio (% The Procter & Gamble Company, Miami Valley Laboratories, P.O. Box 39175, Cincinnati, Ohio 45239)

No Drawing. Filed Oct. 30, 1970, Ser. No. 85,804

Int. Cl. A61k *27/00*

U.S. Cl. 424—128 5 Claims

Compositions for inhibiting anomalous deposition and mobilization of calcium phosphates in animal tissue, comprising an effective amount of certain ammonium salts of condensation products of ammonia and phosphorus in a pharmaceutical carrier; and a method for treating conditions involving pathological calcification and hard tissue demineralization in an animal comprising administering to such animal said compositions.

3,703,580

ANTIBACTERIAL MEDICINAL COMPOSITIONS

Harold Leon Newmark, Maplewood, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Filed Aug. 29, 1969, Ser. No. 854,260

Int. Cl. A61k *21/00*

U.S. Cl. 424—181 5 Claims

Therapeutic compositions are described which comprise a mixture of (a) a 3-(substituted benzamido)-4-hydroxy-8-methyl-7-[3-0-(5 - substituted - 2 - pyrrolylcarbonyl)-noviosyloxy]-coumarin or a nontoxic pharmaceutically acceptable cationic salt thereof and (b) N-methylglucamine.

The compositions can be formulated into suitable dosage forms for oral administration and, when so administered, satisfactory blood levels of the active ingredient are achieved at relatively low dosages.

3,703,581

SUBSTITUTED PYRIDINES EMPLOYED IN ANIMAL HUSBANDRY FOR CONTROLLING COCCIDIOSIS

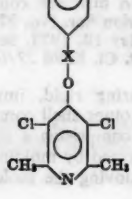
Graham T. Stevenson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Apr. 1, 1970, Ser. No. 24,815

Int. Cl. A61k *27/00*

U.S. Cl. 424—263 8 Claims

Animals are treated by oral administration of a substituted pyridine compound to allow maximum normal growth of the animals by the control of protozoan organisms and mitigate against the attack of gastrointestinal parasites. The pyridine compound is of the formula:



wherein X represents sulfonyl

or carbonyl

3,703,582

ARYL PYRIDINE CARBOXYLIC ACIDS IN THE TREATMENT OF INFLAMMATION

Tsung-Ying Shen, Westfield, William V. Ruyle, Scotch Plains, and Gordon L. Walford and Bruce E. Witzel, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 836,621, June 25, 1969, now Patent No. 3,655,679, dated Apr. 11, 1972. This application Apr. 20, 1970, Ser. No. 30,300

Int. Cl. A61k *27/00*

U.S. Cl. 424—266 15 Claims

Aryl pyridine carboxylic acids and their derivatives are described and the processes for preparing the same are disclosed. These compounds exhibit anti-inflammatory properties and also possess an effective degree of antipyretic and analgesic activity.

3,703,583

ANTICALCULUS FORMULATIONS

Donald J. Martin, Fair Lawn, N.J., assignor to Lever Brothers Company, New York, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 700,007, Jan. 24, 1968. This application June 10, 1971, Ser. No. 151,954

Int. Cl. A61k *7/16*

U.S. Cl. 424—54 1 Claim

Dental formulations, such as tooth paste, tooth powder, and mouth wash, containing anticalculus agents selected from the group consisting of N-methyl-N-dodecyl-N-(2-hydroxyethyl) - N - benzyl ammonium chloride, N-methyl-N-(2-hydroxydodecyl) - N - (2-hydroxyethyl)-N-benzyl ammonium chloride, N-methyl-N-(2-hydroxytetradecyl)-N-(2-hydroxyethyl - N - benzyl ammonium chloride, and di-isobutylphenoxy-ethoxy-ethyldimethyl-benzyl ammonium chloride, are disclosed.

3,703,584

PROCESS OF SENSITIZING CONVERTED-TYPE SILVER HALIDE EMULSIONS WITH NOBLE-METAL SALTS

Robert Franklin Motter, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Aug. 20, 1970, Ser. No. 65,696

Int. Cl. G03c *1/28*

U.S. Cl. 96—108 10 Claims

Conversion-type silver halide emulsions are made by adding a noble-metal salt to the emulsion before or during the conversion step. In one embodiment, gold salts, which are generally known as silver halide sensitizers, are added after initial formation of the grain in the conversion process and before 80% of the conversion step is complete. Improved internal-radiation sensitivity is observed in converted-type emulsions made by this process.

3,703,585

D.C. SPUTTERING OF PARTICULATE POLYMERIC COMPOUNDS ONTO A SUBSTRATE

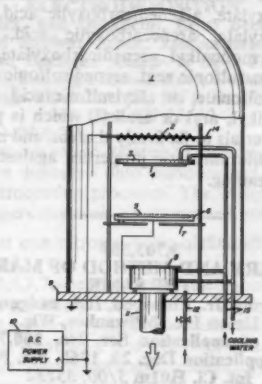
John L. Agnone, Rochester, Robert V. Fister, Hilton, and Jon C. Sheppard, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 24, 1970, Ser. No. 49,468

Int. Cl. C23c *15/00*

U.S. Cl. 204—192 6 Claims

A polymeric material such as Teflon polytetrafluoroethylene (PTFE) is glow coated on a substrate inside a chamber by placing a thin layer of PTFE powder in a shallow tray constituting a cathode, and applying a D.C. potential between the cathode and an anode to sputter



the polymeric material and form a thin film on the substrate. The substrate can be a part of the anode.

3,703,586

STABILIZATION OF POLYMERS AGAINST POST-POLYMERIZATION CROSSLINKING

Bruce W. Habeck, Cuyahoga Falls, and Donald E. Miller, Akron, Ohio, assignors to The Goodyear Tire and Rubber Company, Akron, Ohio

Original application Oct. 19, 1967, Ser. No. 676,428, now Patent No. 3,563,949, dated Feb. 16, 1971. Divided and this application Sept. 18, 1970, Ser. No. 73,604

Int. Cl. C08f *45/58*

U.S. Cl. 260—45.95 R 6 Claims

Polymers containing divinyl benzene and stabilized with phenolic stabilizers such as 2,5-ditert.butyl hydroquinone and 4,4'-methylene bis(2,6-ditert.butyl phenol).

3,703,587

USE OF POLY-E STER-AMIDE-ACIDS AS RUST OR CORROSION INHIBITORS

Theodore Spanos III, Immokalee, Fla., and Richard L. Godar, St. Louis, Mo., assignors to Petrolite Corporation, Wilmington, Del.

No Drawing. Original application June 3, 1968, Ser. No. 733,788. Divided and this application June 7, 1971, Ser. No. 150,833

Int. Cl. C23f *11/14*

U.S. Cl. 21—2.5 8 Claims

Process of inhibiting corrosion of metals and alloys in contact with corrosive media comprising contacting said metals and alloys with poly-ester-amide-acids formed by reacting (1) an alkyl or an alkenyl succinic acid or the anhydride thereof with (2) a polyol, the product of which is reacted with an alkanol amine to form an ester-amide and then reacting so-formed ester-amide with an alkyl or an alkenyl succinic acid or the anhydride thereof.

3,703,588

METHOD FOR IMPARTING ANTISTATIC PROPERTIES TO POLYMERIC MATERIALS

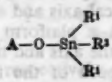
Norio Saito, Nara-ken, and Hiroshiro Kimura, Uji-shi, Japan, assignors to Norio Saito, Nara-ken, and Unitika Ltd., Hyogo-ken, Japan

No Drawing. Filed Nov. 21, 1969, Ser. No. 878,899

Int. Cl. D06m *13/50*

U.S. Cl. 117—138.8 B 5 Claims

An organic tin compound of the formula:

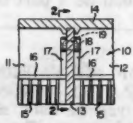


wherein A is a residue of monoalkyl phosphate, dialkyl phosphate, monoalkyl phosphite, dialkyl phosphite, alkanecarboxylic acid, alkanedicarboxylic acid, monoalkyl alkanedicarboxylate, alkenedicarboxylic acid, monoalkyl alkenedicarboxylate, arenecarboxylic acid, arenedicarboxylic acid, monoalkyl arenedicarboxylate, alkanesulfonic acid, arenesulfonic acid, arenedisulfonic acid, monoalkyl arenedisulfonate, or alkylsulfuric acid, and R^1 and R^2 are each alkyl, aryl or aralkyl, which is produced on polymeric materials to fix firmly thereon and imparts them excellent durable antistatic properties against both washing and dry-cleaning.

3,703,589
BATTERY AND METHOD OF MAKING THE SAME

Canby A. Rigsby, Jr., Elmwood, Ind., assignor to Globe-Union Inc., Milwaukee, Wis.

Continuation of application Ser. No. 200,713, June 7, 1962. This application Dec. 20, 1965, Ser. No. 520,300
Int. Cl. H01m *5/00, 35/32*
U.S. Cl. 136—134 R **23 Claims**

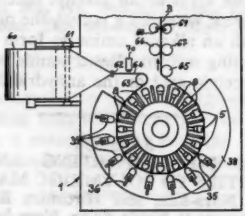


A storage battery having at least two cells separated by a partition with an intercell connector extending through the partition near the top and consisting of an integral mass of metal connected to the plates of one cell or one side of the partition and to the plates of the other cell on the other side of the partition and leading sealingly through the partition.

3,703,590
APPARATUS FOR THE PRODUCTION OF SYNTHETIC PLASTIC BAGS

Hans Holler and Josef Breidenbach, Bergisch Gladbach, and Aloys Milles, Leichlingen, Germany, assignors to Gebruder Heller G.m.b.H., Bergisch Gladbach, Germany

Filed June 21, 1971, Ser. No. 154,957
Claims priority, application Germany, June 22, 1970, P 20 30 599.1
Int. Cl. B30b *15/34*
U.S. Cl. 156—583 **15 Claims**



Apparatus for the production of bags having overlapping layers of bondable synthetic plastic material has an annulus of first sealing members which are rotated by a carrier about a vertical axis and a set of second sealing members mounted on a platform which is oscillatable back and forth about the axis and moves for a certain interval at the exact speed of the first carrier while the carrier and the platform rotate in the same direction to thereby maintain each second sealing member in alignment with the adjoining first sealing member. A blank having overlapping bondable layers is advanced between the first and second sealing members at the exact speed of and in the same direction as the first sealing members, and the platform support pneumatic cylinders which press the second sealing members toward the adjacent first sealing members while the platform rotates in the same direction and at the speed of the carrier whereby the cooperating first and second sealing members compress selected portions of the blank therebetween to provide such portions with seams. The blank is thereupon severed midway across each seam to yield a succession of discrete bags each of which is open at one or both ends, depending on the nature of the blank. The first sealing members alternate with rod-shaped guide members which engage the blank and are movable radially of the carrier to change the length of the path for the blank. The first sealing members can be retracted away from the path for the blank to prevent charring when the apparatus is idle.

3,703,591
TRIGLYCERIDE HYDROLYSIS AND ASSAY

Giovanni Bucolo, San Diego, and Harold David, Los Angeles, Calif., assignors to Calbiochem, Los Angeles, Calif.

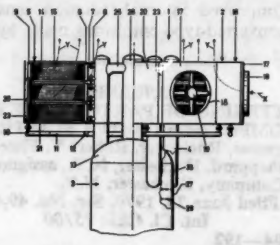
No Drawing. Filed Dec. 16, 1970, Ser. No. 98,904
Int. Cl. C12k *1/04*
U.S. Cl. 195—103.5 R **35 Claims**

Glycerol esters present in aqueous media, such as serum triglyceride and milk fat, are assayed by complete enzymatic hydrolysis using both a lipase and a protease, whereupon the liberated glycerol is determined. A number of alternative enzymatic procedures are provided for the glycerol assay, all in the original aqueous medium, such as conversion to glycerol-1-phosphate with glycerol kinase; conversion of ATP to ADP by the same reaction followed by conversion of the ADP plus phosphoenolpyruvate using pyruvate kinase to ATP and pyruvate ion followed by determining the latter; and alternatively converting the pyruvate ion so formed with NADH using lactate dehydrogenase to lactate ion and NAD and determining the latter by optical measurement.

3,703,592
CONDENSER FOR LOW BOILING FRACTIONS IN RECTIFYING OR DISTILLING COLUMNS

Harry Kassat, Bochum, Ernst Kissel, Ludwigshafen, and Herbert Kolenda, Herbede, Germany, assignors to Gea Luftkuhlergesellschaft Happel GmbH & Co. K.G., Bochum, Germany

Filed July 27, 1970, Ser. No. 58,418
Claims priority, application Germany, Aug. 1, 1967, P 19 39 245.1
Int. Cl. B01d *3/00, 5/00*
U.S. Cl. 202—185 B **24 Claims**



A condenser for the head fraction in distilling or rectifying columns has vertical risers which are connected

to and extend upwardly from the shell of the column. The risers support pairwise arranged groups of horizontal, vertical or sloping heat-exchanging pipes which extend outwardly from and receive the fraction from the respective risers. Each pair of groups carries a housing which serves to shield the pipes from wind and precipitation and supports an adjustable axial fan which circulates atmospheric air across the pipes to effect condensation of the fraction. The compartments between the neighboring pairs of groups are partially enclosed to prevent immediate recirculation of heated air. The condensate is collected in chambers which return some of the condensate into the shell by gravity flow.

3,703,593
METHOD OF PREPARING AN IMPROVED DEHYDROGENATION CATALYST
Robert R. Turley, Lake Jackson, William M. Castor, Clute, and Kenneth R. Nunnally, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.
Filed July 10, 1970, Ser. No. 53,881
Int. Cl. B01j *11/22*
U.S. Cl. 252—470 **11 Claims**

A method for preparing an improved dehydrogenation catalyst comprising iron oxide, an alkali metal oxide, and a chromium compound wherein an improvement is achieved by employing both yellow and red iron oxides in particular proportions with respect to each other in the preparation of the catalyst.

3,703,594
METHOD FOR MANUFACTURING A PHOTOCONDUCTIVE POWDER
Shigeaki Nakamura and Tadao Nakamura, Kawasaki-shi, and Tadao Kohashi, Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Continuation-in-part of abandoned application Ser. No. 715,045, Mar. 21, 1968. This application Nov. 9, 1971, Ser. No. 197,070
Claims priority, application Japan, Mar. 31, 1967, 42/20,846; Apr. 7, 1967, 42/22,545
Int. Cl. H01c *7/08*
U.S. Cl. 252—501 **6 Claims**

A photoconductor of the kind consisting essentially of CdSe or CdS-Se, and containing copper as an activator and a halogen as a coactivator. In the photoconductor, zinc is added as a further additive in order to improve its sensitivity to a low intensity optical input and to increase its dark resistance so that the photoconductor can be employed for the manufacture of various photoelectric devices having an improved and stable operating characteristic.

3,703,595
GLASS-CLEAR POLYAMIDES
Georg Falkenstein, Ludwigshafen, Hans Georg Peine, Frankenthal, and Helmut Doerfel, Paul Raff, and Ludwig Schuster, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Continuation-in-part of application Ser. No. 674,102, Oct. 10, 1967. This application Apr. 20, 1970, Ser. No. 30,213
Claims priority, application Germany, Oct. 18, 1966, P 15 95 354.5
Int. Cl. C08g *20/20*
U.S. Cl. 260—78 R **4 Claims**

Glass-clear polyamides consisting essentially of polymeric condensation products of a mixture of stereoisomers of 2,2-bis-(4-aminocyclohexyl)-propane and an aliphatic or carbocyclic dicarboxylic acid having six to ten carbon atoms and, if desired, caprolactam or adipic acid and hexamethylene-diamine. The polyamides are useful for the production of moldings.

3,703,596
COATING COMPOSITIONS FOR ELECTRODEPOSITION
Matthias Marx, Bad Durkheim, Ernst Becker, Ludwigshafen, and Herbert Spoor, Limburgerhof, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Filed Jan. 19, 1971, Ser. No. 107,852
Int. Cl. C08f *15/40*
U.S. Cl. 260—29.6 TA **6 Claims**

The present invention relates to coating compositions which may be deposited onto cathodes and are thus suitable for electrocoating processes. The compositions comprise copolymers containing polymerized units of

(1) at least one nitrogen-basic olefinically unsaturated compound,
(2) 3a,4,5,6,7,7a-hexahydro-4,7-methanoindenyl acrylate-5 or methacrylate-5,
(3) at least one copolymerizable olefinically unsaturated derivative of at least one oxa-alcohol and, if desired,
(4) further copolymerizable olefinically unsaturated monomers, which copolymers are used for electrocoating in aqueous solution or dispersion at least partly in the form of salts of water-soluble acids. The compositions of the invention are suitable for the production of durable coatings on metal parts.

3,703,597
PREPARATION OF BENZILIC ACID COMPOUNDS
Werner B. Rothweiler, Mobile, Ala., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.
No Drawing. Filed July 22, 1969, Ser. No. 843,844
Int. Cl. C07c *65/14*
U.S. Cl. 260—520 **4 Claims**

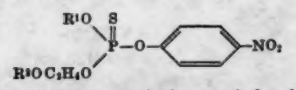
A novel and simple procedure is provided for synthesizing benzilic acid compounds and particularly, 4,4'-dihalobenzilic acids such as, for example, 4,4'-dibromobenzilic acid and 4,4'-dichlorobenzilic acid by a novel and simple procedure involving reacting a bis-(substituted or unsubstituted phenyl) acetic acid with a halogenating agent followed by hydrolysis. The benzilic acid compounds thus produced are useful as intermediates in the preparation of benzilic acid esters, the last mentioned compounds being employed as acaricidal and insecticidal agents.

3,703,598
PURIFICATION OF p-AMINOPHENOL
Frank A. Baron, Short Hills, N.J., assignor to Mallinckrodt Chemical Works, Lodi, N.J.
No Drawing. Filed Nov. 4, 1969, Ser. No. 874,072
Int. Cl. C07c *85/16, 91/44*
U.S. Cl. 260—575 **10 Claims**

A process for the purification of crude p-aminophenol by recrystallization from aqueous polyfunctional mild acids, including phosphoric, lactic, glycolic and citric acids.

3,703,599
INSECTICIDAL PHOSPHORIC ACID ESTERS
Zitsuichi Kishikawa, Osaka, and Sadafumi Maekawa, Kawachi-Nagano, Japan, assignors to Nihon Nohyaku Kabushiki Kaisha, Tokyo, Japan
No Drawing. Filed Jan. 16, 1969, Ser. No. 791,769
Int. Cl. A01n *9/36*
U.S. Cl. 424—217 **11 Claims**

An insecticide composition comprising at least one of the organic phosphoric acid esters having the following formula:



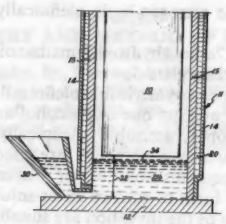
wherein R^1 and R^2 respectively stand for lower alkyl radicals and an inert carrier.

ELECTRICAL

3,703,600
METHOD OF STARTING ELECTROSLAG REMELTING PROCESS WITH MOLTEN SLAG

William W. Scott, Jr., Parkesburg, Pa., assignor to Lukens Steel Company, Coatesville, Pa.

Filed Dec. 29, 1971, Ser. No. 213,561
Int. Cl. H05b 3/60
U.S. Cl. 13—9 7 Claims

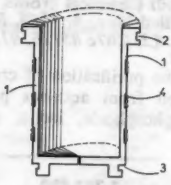


The starting up of an electroslag remelting process with molten slag, the volume of such slag being inherently variable within determinable limits, by positioning the bottom of the electrode preferably not more than 2 inches above the maximum anticipated slag level, charging the molten slag into the bottom of the mold within a period of preferably 1 to 4 minutes, and immediately thereafter with voltage applied to the electrode, lowering same at a speed of between 5 and 30 seconds per inch until contact is made with the top of the slag and a current flow is registered, the slag becoming highly fluid within a few minutes thereafter.

3,703,601
LADLE FOR INDUCTIVE TREATMENT

Louis Babel, Sauvigny-les-Bois, France, assignor to Creusot-Loire, Paris, France

Filed April 7, 1971, Ser. No. 131,926
Claims priority, application France, June 16, 1970, 7022041
Int. Cl. H05b 5/12
U.S. Cl. 13—27 1 Claim



A ladle for inductive treatment, having a non-magnetic metal casing and a refractory lining, the metal casing being made up of a plurality of elements each forming an open circuit, each of small section relative to the inductive vector and each insulated from its neighbors.

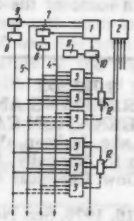
ERRATUM

For Class 16—126 see:
Patent No. 3,703,683

3,703,602
MACHINE FOR TEACHING FOREIGN LANGUAGES

Leonid Valdimirovich Shenshev, prospekt, 88, Korpus 3, kv. 126, Moscow, Leninsky, U.S.S.R.

Filed Nov. 4, 1970, Ser. No. 86,859
Int. Cl. G09b 5/04
U.S. Cl. 35—35 C 12 Claims

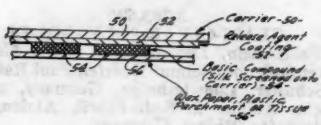


A machine for teaching foreign languages, comprising a multichannel magnetic sound recorder with a tape loop carrying pre-recorded fragments of speech and control signals, and students' terminals connectable to the channels of said magnetic sound recorder to synthesize various phrases from the pre-recorded speech fragments, each of said terminals comprising: an acoustic output unit; a phrase shaper incorporating multiple switches; a pause shaper to substitute pauses for various combinations of the fragments of a phrase, said pause shaper being connected to said phrase shaper; a shaper unit for automatic written translation of the oral speech being synthesized, said unit being connected to the phrase shaper and to the pause shaper. The machine enables students to adapt to their personal peculiarities in a versatile manner the form, content and degree of difficulty of the oral exercises being performed.

3,703,603
RUB-ON SUB-ELEMENT FOR ELECTRONIC CIRCUIT BOARD

Norman R. Levesque, and Donald E. Harper, both of Inglewood, Calif., assignors to Circuit-Stik, Inc., Gardena, Calif.

Filed May 10, 1971, Ser. No. 141,655
Int. Cl. H05k 1/02, 3/20
U.S. Cl. 174—68.5 4 Claims



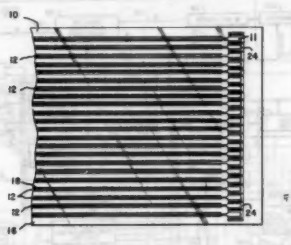
An electronic sub-element is provided having a particular circuit configuration, and which in conjunction with other similar sub-elements of the same or different circuit configuration, may be adhesively attached to a panel-like base member so as to constitute a printed circuit assembly. The electronic sub-element of the invention is in the form of conductive metallic particles which are adhesively attached to a carrier strip, such as plastic or wax paper, and which form a multiplicity of electrical conductors separated from one another, the particles being intermixed with adhesive material.

3,703,604

FLAT CONDUCTOR TRANSMISSION CABLE

Homer Ernst Henschen, Carlisle, and Dale Richard Zell, Elizabethtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 99,194, Dec. 17, 1970, abandoned. This application Nov. 30, 1971, Ser. No. 203,412
Int. Cl. H02g 15/08
U.S. Cl. 174—75 R 11 Claims



A flat shielded cable comprising a plurality of parallel spaced-apart signal conductors in a first plane and a shield member in the form of a conductive ground plane facing said signal conductors and being positioned in a second plane, the shield member having preselected amounts of conductive material removed in the area opposite the signal conductors. By varying the amount of shield member surface area facing the signal conductors, the capacitance between the signal conductors and the ground plane can be significantly altered to thereby control the characteristic impedance of the cable.

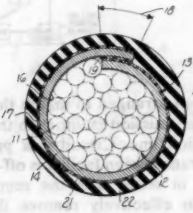
At the terminating ends of the cable, a zone devoid of conductive material extends transversely across the ground plane in the vicinity of the signal conductors. This zone permits the interconnection of the signal conductors to suitable connector means while preventing electrical contact between the connector contact members, which engage the signal conductors, and the ground plane. To provide impedance matching between the connector and cable ends, the zone is bridged by thin conductive strips integral to the ground plane.

3,703,605

COMMUNICATIONS CABLES WITH SEALED METALLIC MOISTURE BARRIERS

Matthew R. Dembiak, Clifton, N.J., and George H. Webster, Timonium, Md., assignors to Western Electric Company, Inc., New York, N.Y., by said Dembiak and Bell Telephone Laboratories, Inc., Murray Hill, N.J., by said Webster

Continuation-in-part of Ser. No. 809,589, March 24, 1969, abandoned. This application March 17, 1971, Ser. No. 125,362
Int. Cl. H01b 7/18, 11/00
U.S. Cl. 174—107 7 Claims



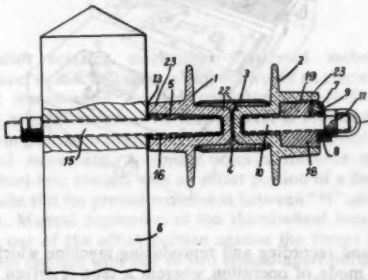
Successive portions of an aluminum tape having one major surface thereof coated with an adhesive copolymer across the entire transverse width thereof and the other major surface precoated with a stripe of adhesive material along an edge portion are folded longitudinally about successive sections of a cable core which are being advanced along a predetermined path to form an overlapped seam so that the adhesive copolymer on an edge portion of the one major surface of the tape overlaps the stripe. Subsequently, the adhesive materials on the major surfaces along the overlapped seam develop an adhesive bond by the application of heat and pressure prior to or during the extrusion of a plastic jacket over the tape. The adhesive material on the other, now inwardly facing, major surface is substantially restricted in location and is adhesively bonded to the portion of the inwardly facing major surface of the tape which forms the overlapped seam with a portion of the one, now outwardly facing, major surface. The remaining portion of the inwardly facing major surface of the aluminum tape is bare and facilitates grounding the cable at a splice location.

3,703,606

PIN-TYPE INSULATOR

Michel Willem, Cusset, France, assignor to Ceraver, Paris, France

Filed May 21, 1971, Ser. No. 145,828
Claims priority, application France, May 25, 1970, 7019002
Int. Cl. H01b 17/16, 17/32
U.S. Cl. 174—169 4 Claims



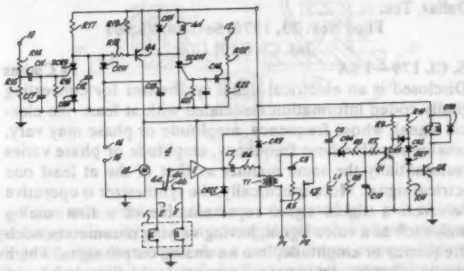
In a pin-type insulator, one of two channel-shaped conductor-gripping elements is sealed to the outermost dielectric element to transmit to that dielectric element, either directly or via a cementitious mass filling a cavity in that dielectric element, at least part of the stress imposed on the gripping elements by the conductor which is supported by the insulator.

3,703,607

TELEPHONE DIALING AND INFORMATION TRANSMISSION CIRCUIT

Herbert I. Cohen, Pt. Pleasant Beach, N.J., assignor to Acron Corporation, Lakewood, N.J.

Filed Aug. 18, 1970, Ser. No. 64,758
Int. Cl. H04m 11/04
U.S. Cl. 179—5 P 1 Claim



The specification discloses a circuit for automatically dialing pre-recorded telephone numbers and transmitting a pre-

recorded message to the number dialed. The circuit is triggered by a contact closure indicating an emergency condition. The triggering energizes the recording media drive motor and selects the appropriate information track on the recording media for connection to the telephone lines. Dialing is accomplished by a relay driving arrangement which amplifies prerecorded dial pulse information and attenuates the message information.

3,703,608

AMPLIFIER SWITCHING MEANS FOR A TELEPHONE ANSWERING DEVICE

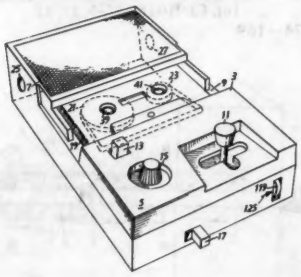
Leonard Rubenstein, London, England, assignor to Learning Appliances Limited, London, England

Filed Sept. 17, 1970, Ser. No. 73,162

Claims priority, application Great Britain, Sept. 19, 1969, 46,246/69

Int. Cl. H04m *1/64*; **G11b** *23/04*

U.S. Cl. 179—6 R **12 Claims**



A sound recording and reproducing machine which has a normal mode of operation wherein a tape is driven from a supply spool to a take-up spool at a speed suitable for reproducing or recording information on the tape and a series of switching operations are performed in synchronism with the movement of tape past a sound recording and reproducing head. To achieve synchronsim a switching shaft is coupled to one of the spools and a switching mechanism is releasably coupled to the switching shaft. The switching shaft is rotated in synchronism with the spool throughout all modes of operation of the machine. The switching mechanism is only coupled to the shaft when the machine is operated in the normal mode of operation, thereby reducing loading on the spool during operation in other modes.

3,703,609

NOISE SIGNAL GENERATOR FOR A DIGITAL SPEECH SYNTHESIZER

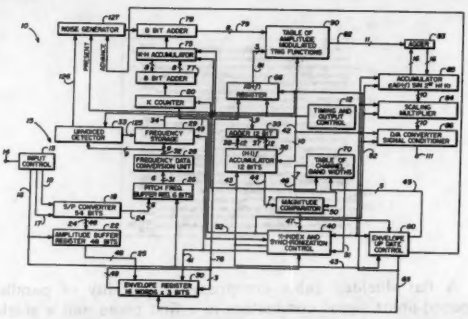
Norman P. Gluth, Dallas, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed Nov. 23, 1970, Ser. No. 91,901

Int. Cl. G10l *1/00*

U.S. Cl. 179—1 SA **14 Claims**

Disclosed is an electrical-signal synthesizer for converting digitally coded information associated with at least one electrical signal, whose frequency, amplitude or phase may vary, to analog signals whose frequency, amplitude or phase varies in substantially the same manner as that of the at least one electrical signal. More specifically, the synthesizer is operative to convert a digital signal representative of a first analog signal, such as a voice signal, having varying parameters, such as frequency or amplitude, into an analog output signal which varies in substantially the same manner as the first signal, and where the digital signal is composed of consecutive frames of words, and one word of each frame is representative of a fundamental frequency associated with the first signal at an instant of time, and successive words in the respective frame are representative of the energy associated with at least one of a plurality of successive bands or spectrum-segments of the first signal to be reproduced, at the given instant in time, each of the successive bands bearing a predetermined frequency relationship and wherein the synthesis of the output signal is accomplished by generating from the word representative of the fundamental frequency in each respective frame, a stream of



digital words representative of the frequency and each of its harmonics at each instant of time and producing therefrom a second stream of digital words which is indicative of the frequency components of the original sound and modulating the second stream with amplitude data corresponding to discrete periods of time and adding the respective digital signals so produced for a discrete period of time and converting the same to an analog signal which is representative of the original voice signal.

3,703,610

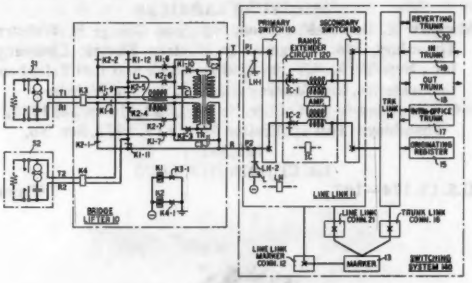
PARTY-LINE BRIDGE-LIFTER

Grace Lakin Ebbe, Clark, and Gustav Paul Marki, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 21, 1970, Ser. No. 66,022

Int. Cl. H04m *5/00*

U.S. Cl. 179—35 **11 Claims**



A bridge-lifter circuit arranged to match the impedance of party-line off-hook transmission facilities to the impedance of a common transmission line. Circuitry is provided so that when one party-line transmission facility is off-hook a high impedance is switched in series with the remaining on-hook party-line facilities to effectively remove the bridged impedances from across the off-hook facility. When more than one transmission facility is off-hook, an impedance matching transformer, arranged to pass d.c. supervisory signals, is serially inserted between the common transmission line and off-hook party-line transmission facilities to match the combined impedances of the bridged facilities to the impedance of the common line.

3,703,611

TELEPHONE SYSTEM

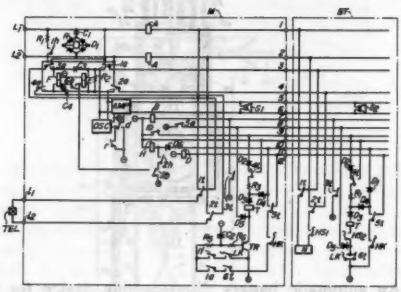
Hiromoto Kiyomiya; Yukio Fukumiya; Mithuzi Aoki, all of Yokohama, and Hiromichi Mama, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Electronics Engineering Co. Ltd., Yokohama, Japan

Filed March 17, 1970, Ser. No. 20,243

Claims priority, application Japan, March 31, 1969, 44/23812

Int. Cl. H04m *1/00*

U.S. Cl. 179—99 10 Claims



A telephone system having a main unit including a talking path over an office line, a talking path over an extension line, an extension ringing circuit and a control circuit, and a plurality of key telephone sets connected in parallel with the main unit and each having a talking circuit, a call indicating circuit and a control circuit. Each key telephone set is provided with a first non-locking key disposed on the control circuit thereof, a relay which is energized and holds itself via the control circuit of the main unit in response to the actuation of the first non-locking key, and a second non-locking key for releasing the relay via the control circuit of the main unit so that the talking circuit of each key telephone set is connectable with the office line and the extension line through the contacts of the relay.

3,703,612

SINGLE TAKE-UP REEL, AUTOMATIC THREADING, MAGNETIC TAPE DUPLICATING APPARATUS

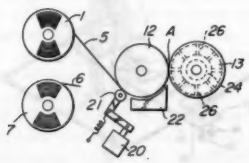
Yutaka Higashida, Nishinomiya, and Kaoru Imanishi, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed March 16, 1970, Ser. No. 19,944

Claims priority, application Japan, March 25, 1969, 44/24512; March 25, 1969, 44/28859; March 26, 1969, 44/27442; July 9, 1969, 44/66831

Int. Cl. G11b *5/86, 15/66*

U.S. Cl. 179—100.2 E 6 Claims



A magnetic tape duplicating apparatus of the type in which a recorded master tape and an unrecorded slave tape are taken up on a take-up reel with the magnetic coatings of the respective tapes in intimate contact with each other and a transfer bias magnetic field is impressed on both tapes on the take-up reel thereby to transfer a signal on the recorded master tape onto the unrecorded slave tape, wherein a device is provided for automatically engaging the master tape and the slave tape around the take-up reel at the outset of the tape winding operation, so as to enhance the efficiency of the tape duplicating operation.

3,703,613

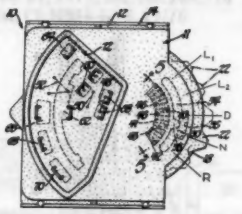
ROTARY SWITCH WITH IMPROVED PIVOTALLY AND RECIPROCABLE MOUNTED THUMBWHEEL ACTUATOR

William E. Abel, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed July 16, 1971, Ser. No. 163,343

Int. Cl. H01h *19/14*; H01b *21/76*

U.S. Cl. 200—11 TW 6 Claims



The shift selector mechanism illustrated includes a thumbwheel switch arrangement for control of an electrically-actuated transmission having conventional R–N–D–L_2–L_1 gearshift selector ranges. The thumbwheel is mounted on a fixed pivot post by a slotted connection for both pivotal and reciprocal movement. A spring urges a follower on the thumbwheel into contact with an offset portion of a fixed arcuate guide slot for pivotal movement between "N" and "D" positions. Manual depression of the thumbwheel moves the follower out of the offset portion against the forces of the spring into contact with one of two spaced-apart portions of the arcuate guide slot for pivotal movement to some one of the R–L_2–L_1 positions. Contacts mounted on an end portion of the thumbwheel align radially and circumferentially with appropriate terminals for actuation of conventional transmission solenoid valves. A detent arrangement assures retention of the thumbwheel in the selected shift position.

3,703,614

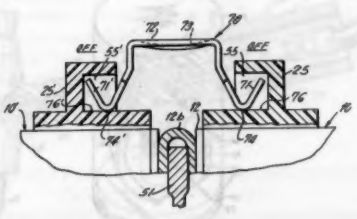
HANDLE TIE FOR PUSH-PUSH CIRCUIT BREAKERS

Martin V. Zubaty; Louis W. Higgins, both of Bellefontaine, Ohio, and I.T.E. Imperial Corporation, Philadelphia, Pa.

Filed Dec. 29, 1971, Ser. No. 213,400

Int. Cl. H01b *9/26, 33/52*

U.S. Cl. 200—50 C 10 Claims



A non-removable handle tie is connected to a pair of push-push type circuit breakers arranged in back-to-back relationship. The handle tie includes a central finger engageable portion and oppositely extending offset sections entered into cavities of the circuit breakers through rear openings into the cavities. Both the stamped metal and molded plastic constructions for the handle tie are loosely connected to the circuit breaker

handles to permit tilting of the handle tie when both handles are not in corresponding positions, yet this connection permits simultaneous manual operation of both circuit breakers. In the molded resilient construction of the handle tie the unit is formed so as to experience controlled bending when the handles are not in corresponding positions. However, when the handle tie is depressed for manual operation, the handle tie exhibits rigidity in transmitting operating forces.

3,703,615

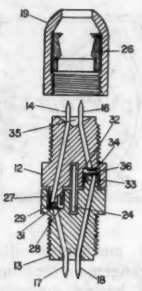
CABLE CONNECTOR AND SWITCH

Kuno J. Vogt, 5854 Kantor Court, San Diego, Calif.

Filed June 10, 1971, Ser. No. 151,751

Int. Cl. H01v *33/30*

U.S. Cl. 200—51.07 **5 Claims**



A cable connector and switch for connecting the ends of two round cables as a rotary switch in which identical halves comprising threaded body portions with mating threaded caps are provided with rigid conductors terminating at their outer ends in a point for insertion into the conductive portion of cables and making contact with the insulated conductors within cables. The caps are threadably engaged with the connector portions forcibly contracting restraining fingers onto the cables being connected. The switch halves terminate in mating protuberances and recesses comprising the switch connectors, a portion of the recess being conductively coated for making electrical contact at one extreme of rotation and breaking electrical contact at the other extreme of rotation.

3,703,616

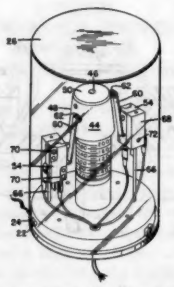
GAUGE ACTUATED CIRCUIT CONTROL UNIT

Clyde J. Martin, Cincinnati, Ohio, assignor to Martin Industries, Inc., Cincinnati, Ohio

Filed March 18, 1970, Ser. No. 20,735

Int. Cl. G01d *13/26*; G01l *19/06*

U.S. Cl. 200—56 R **15 Claims**



The control unit comprises a base carrying an upstanding pressure gauge upon which is mounted a reciprocative conical control head arranged to actuate switches, contactors, circuit breakers and other electrical components clustered about the gauge, said components being adjustable for selective sequential actuation by the control head.

3,703,617

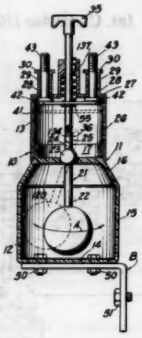
AUTOMATIC DISCONNECT FOR A VEHICULAR BATTERY

Marvin D. Burnett, Route 2, Alpharetta, Ga.

Filed Oct. 16, 1970, Ser. No. 81,225

Int. Cl. H01h *35/14*

U.S. Cl. 200—61.5 **3 Claims**



An automatic battery disconnecting device for vehicles comprising a hollow, non-conducting housing containing a pivotally mounted pendulum member temporarily supporting a spring-biased pin in an upright operative position, and having a contact member in conducting, bridging engagement with the bottom of two terminals which project through the top of the housing, the terminals being connected in series with the battery of the electrical system of a vehicle. The pendulum members supports the pin in such a manner as to separate from the pin upon an excessive swing of the member, thus allowing the pin to be urged downward by the spring, causing the pin to come to an inoperative position with the contact member being disengaged from the terminals, thereby opening the electrical circuit of the vehicle. The pendulum member would undergo an excessive swing whenever the vehicle, in which the invention is mounted, suddenly experiences an impact or collision. The pin is provided with reset means for reengaging the pin with the pendulum member so as to return the pin to its operative position with the contact member again in conducting engagement with the terminals, closing the electrical circuit within the vehicle. The invention prevents electrical fires due to short circuits whenever the vehicle undergoes any of the above conditions.

3,703,618

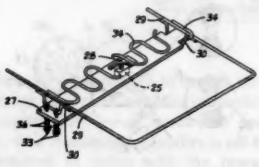
VEHICLE SEAT BELT NON-USE WARNING SIGNAL SWITCH MOUNTING

Fred I. Lewis, 2810 East Tenth Street, Anderson, Ind.

Filed March 24, 1971, Ser. No. 127,580

Int. Cl. H01h *3/14*

U.S. Cl. 200—85 R **5 Claims**

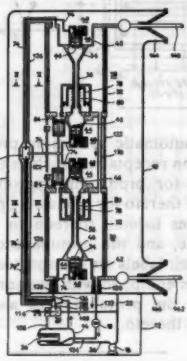


A vehicle seat has a switch therein adjustably mounted to respond to application of a selectable minimum seat occupant weight above the switch to close the switch and actuate a seat belt warning circuit, the mounting having compliance and resilience to avoid creation of a lump in the seat as the seat is depressed. One switch mount includes a simple beam type support, while the other is a cantilever beam.

3,703,619
COMPRESSED GAS CIRCUIT INTERRUPTER HAVING A CLOSED-CYCLE HIGH PRESSURE HEATING CIRCULATION

Jean-Claude Henry, Grenoble, France, assignor to Merlin Gerin, Societe Anonyme, Grenoble, France

Continuation-in-part of Ser. No. 667,687, Oct. 24, 1967, abandoned. This application July 6, 1970, Ser. No. 52,428
Claims priority, application France, Nov. 3, 1966, 6682451
Int. Cl. H01h *33/57*
U.S. Cl. 200—148 E 8 Claims

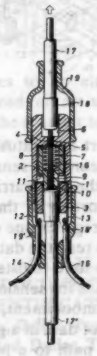


Compressed-gas circuit breaker including piping for breaker, wherein the temperature is maintained substantially constant by surrounding the entire length of said piping unit with an extinguishing gas feed piping in which a closed circuit forced circulation of heated gas is maintained.

3,703,620
PULL SWITCH WITH HOUSING PORTIONS OF DIFFERENT DIAMETERS AND SWITCH CONTACT MODE AT THE INTERFACE OF SAID PORTIONS

Kazue Watanabe, Tokyo, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan

Filed May 17, 1971, Ser. No. 143,968
Claims priority, application Japan, May 21, 1970, 45/43012
Int. Cl. H01h *17/08, 17/16*
U.S. Cl. 200—161 1 Claim

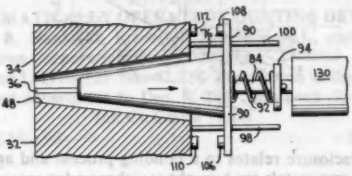


A switching device comprising an electrically insulating movable element included in an insulating housing together with a spring member, an insulating stationary element inserted in an opening of the housing so that it normally contacts the movable element, a pair of contact terminals provided on the stationary element to be brought into contact with a contact on the movable element, and an outer cable incorporated with an inner cable, running through the movable element and the stationary element, for acting on the movable element from the stationary-element side. The insulating stationary element is located in a large diameter portion of the housing but abuts a shoulder forming the interface between the large diameter portion and a smaller diameter portion.

3,703,621
RECIPROCATING FRUSTO-CONICAL PLUG SWITCH CONTACT AND ASSEMBLY

Ronald J. Viola, Fort Lee, and Lawrence V. Keeney, Saddle Brook, both of N.J., assignors to Rapid Electric Co., Inc., Bronx, N.Y.

Filed July 21, 1971, Ser. No. 164,716
Int. Cl. H01h *1/38, 15/10*
U.S. Cl. 200—163 19 Claims

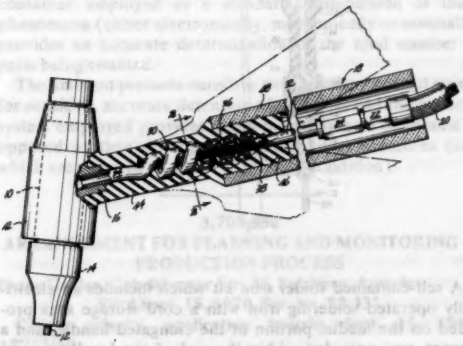


A reversing switch for reversing the supply of current to a load from a DC source including a pair of stacked contact structures, each of which defines two electrical switches operated by means of conical connectors movable within conical bores centered at insulating layers in the stacked structures whereby the direction of current supplied to the load is controlled by the operation of the electrical switches.

3,703,622
GAS-SHIELDED ARC TORCH

Arthur L. Kleppen, Jr., Kent, Wash., assignor to Conley and Kleppen Enterprises, Inc., Kent, Wash.

Filed Dec. 1, 1971, Ser. No. 203,776
Int. Cl. B23k *9/16*
U.S. Cl. 219—75 4 Claims



A gas-shielded arc torch has a flexible shank between the head and the handle and is constructed to employ the inflowing gas to cool the electrode and head, thus maintaining high capacity in the torch, while permitting its production in reduced scale.

3,703,623

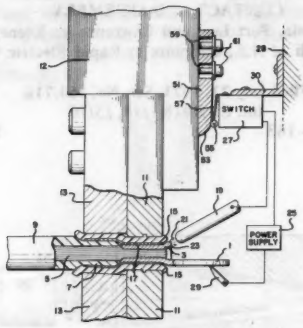
PRE-INSULATED AND UNINSULATED WIRE TERMINAL BONDING PROCESS AND APPARATUS

Robert Charles Swengel, Sr., York, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 774,268, Nov. 8, 1968, abandoned. This application Dec. 3, 1970, Ser. No. 94,722

Int. Cl. B23k 9/00

U.S. Cl. 219—137 10 Claims



The disclosure relates to a bonding process and apparatus whereby two metals are brought together under pressure from a pair of dies or a die and anvil, the interface between the metals being made to achieve an intimate bond by an elevation in temperature provided by heat energy conducted via a portion of one or both metals protruding from the forceful contact area, heat being applied slightly before or simultaneously with the application of pressure, and more particularly, the peak pressure of the crimping characteristic curve, and from a source other than the dies.

3,703,624

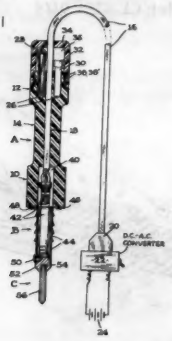
SELF CONTAINED SOLDER IRON KIT

Anton Simsack, 231 East High Street, Elizabethtown, Pa.

Filed Nov. 18, 1970, Ser. No. 90,613

Int. Cl. B23k 3/02; H05b 3/02

U.S. Cl. 219—229 3 Claims



A self-contained solder iron kit which includes an electrically operated soldering iron with a cord storage area provided on the medial portion of the elongated handle, and a storage area provided within the end of the handle remote from the soldering point. The storage area provides for and includes all the necessary soldering materials such as chemicals, flux, fluids, and assorted soldering rods, thereby conveniently embodying everything into one compact kit. Provision is made for double hermetically sealing off the chemicals to avoid potential leakage of corrosion or fumes.

3,703,625

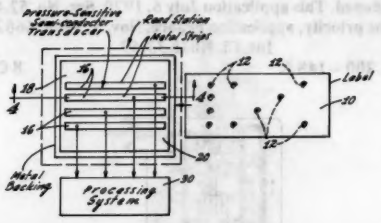
LABEL IDENTIFICATION SYSTEM

Matthew C. Urbin, 4524 La Barca Drive, Tarzana, Calif.

Filed Oct. 2, 1970, Ser. No. 77,605

Int. Cl. G06k 7/00; H01v 7/00; H04r 17/00

U.S. Cl. 235—61.11 C 2 Claims



An improved automatic system is provided for reading identifying labels on receptacles, such as test tubes or bottles, or the like, and for producing appropriate identification signals in response thereto for processing purposes. The labels have protuberances formed thereon in accordance with a preconceived code, and the protuberances are read as the receptacles and their labels are transported past a read station. The read station is equipped with pressure sensitive transducers which sense the protuberances and produce electric signals in response thereto.

3,703,626

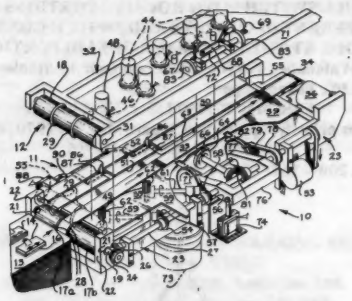
DOCUMENT TRANSPORT APPARATUS AND METHOD

Raymond L. Shanrock, Sunnyvale, Calif., assignor to Data Recognition Corporation, Palo Alto, Calif.

Filed Dec. 14, 1970, Ser. No. 97,976

Int. Cl. G06k 13/26

U.S. Cl. 235—61.11 R 5 Claims



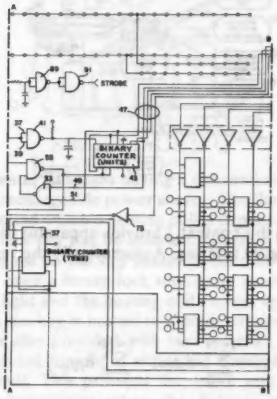
In a document transport apparatus for feeding documents along a path including means for sensing the data carried by the documents, as where the data carried by the document extends in lines across a portion of the document, means for feeding the document to register one of the lines of data with the sensing means so as to read the data. Means for repositioning the document to serve to re-register another of the lines of data with the sensing means for sensing the data in another of the lines. In a particular embodiment, after the sensing means has detected the absence of data in a given line, the document is reversely fed along its path to a position where it can be repositioned for registering a second line of data with the sensing means so as to detect data in the last named line. Repositioning is accomplished by moving a registration guide element or fence from one position to another and then engaging the edge of the document with the guide element while the sensing means remains located at a stationary position. A method is disclosed which carries out the steps of the above functions.

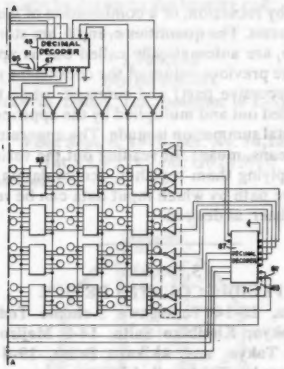
3,703,627

SCANNER SYSTEM

Vander Heyden, and Eric Ernest, both of Hummelstown, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 19, 1970, Ser. No. 81,708
Int. Cl. G06k 7/00
U.S. Cl. 235—61.11 G 2 Claims





The disclosure relates to an electronic system wherein columns of data to be read out are sampled in predetermined order under control of the scanner to read out information on a column by column basis.

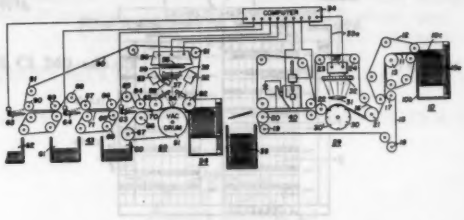
3,703,628

SYSTEM FOR DOCUMENT CODING AND IDENTIFICATION

Herman L. Philipson, Jr., Dallas, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.

Continuation of Ser. No. 618,923, Feb. 27, 1967, abandoned. This application March 29, 1971, Ser. No. 129,164
Int. Cl. G01d 15/18; G06k 7/10, 9/18
U.S. Cl. 235—61.9 R 12 Claims

Method and apparatus for sensing human readable intelligence bearing indicia on documents with high resolution, by generating primary signals representatives of said indicia with translation thereof into simplified bar code, printing the simplified code on the document itself, preferably during continuous travel thereof, and sensing the simple bar code for further handling in sorting and in processing of the data imprinted on the document.

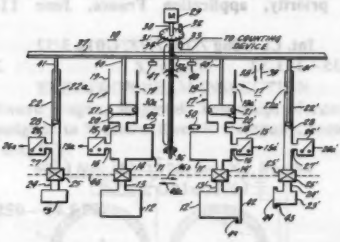


3,703,629

PNEUMATICALLY OPERATED COUNTING DEVICE

Richard B. Hanbicki, Princeton Junction, N.J., assignor to Madatron Corporation, Rocky Hill, N.J.

Filed June 1, 1970, Ser. No. 42,228. The portion of the term of this patent subsequent to Dec. 8, 1987, has been disclaimed.
Int. Cl. G06m 1/00
U.S. Cl. 235—98 9 Claims



Apparatus for counting large numbers of small articles of uniform size. The time duration taken for the return to ambient pressure of a container housing the parts is compared against the occurrence of the same phenomenon, an empty container employed as a standard. Comparison of these phenomena (either electronically, mechanically or manually) provides an accurate determination of the total number of parts being counted.

The ambient pressure-sensitive switch utilizes optical means for sensitive, accurate detention of pressure, and the encoder system employed provides direct measurements of volume as opposed to time duration of the container pressures (i.e., which are required to return to ambient condition).

3,703,630

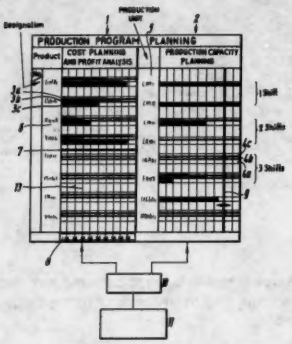
ARRANGEMENT FOR PLANNING AND MONITORING A PRODUCTION PROCESS

Franz Gelder, Gabelsberger Str. 36, Salzburg, Austria

Filed Sept. 15, 1970, Ser. No. 72,331
Claims priority, application Austria, Sept. 15, 1969, A8732/69
Int. Cl. H01j 63/04, 1/63; G06k 15/18
U.S. Cl. 235—151.3 13 Claims

An indicator board for visually displaying values obtained by linear programming, such as the degree of utilization of facilities, production output of different units, etc., comprises

a board having luminescent strips activated by input signals to extents corresponding to values to be displayed. Symbols



designating products and operating units are provided in different fields of the board adjacent to the corresponding strips.

3,703,631

MEAN SPEED INDICATOR SYSTEMS FOR VEHICLES

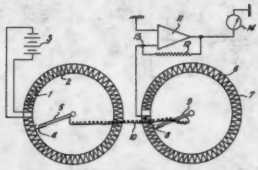
Raymond Gohe, Sainte Genevieve des Bois; Jean Martial Randoing, Boissise le Roi; Max Gohe, La Garenne Colombes, and Jean-Claude Evrard, Perthes en Gatinais, all of France, assignors to Raymond Gohe, Sainte Genevieve and Jean Martial Randoing, Boissise le Roi, France

Filed June 11, 1970, Ser. No. 45,354

Claims priority, application France, June 11, 1969, 6919346

Int. Cl. G06g *7/16, 7/78;* G01p *3/52*

U.S. Cl. 235—151.32 **2 Claims**



A means for speed calculator for vehicles in which the distance travelled by the vehicle and the time taken to travel such distance are converted continuously into proportional movements of two members comprises means for continuously displaying the ratio between the amplitudes of the respective movements of the members, the members being electrical components including variable means varied proportionally to the distance travelled and to the time taken respectively, the said variations producing a variation of electrical values, and means for measuring the ratio of the electrical values.

3,703,632

RECURSION FILTER

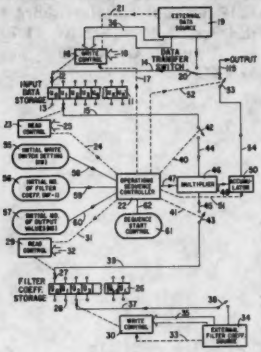
John L. Shanks, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Continuation-in-part of Ser. No. 556,744, June 10, 1966, abandoned. This application Feb. 18, 1972, Ser. No. 227,364

Int. Cl. G06f *7/38;* G01v *1/28*

U.S. Cl. 235—152 **6 Claims**

This invention concerns apparatus for filtering signals. Means are provided for emphasizing only some of the frequency components of signals with respect to others. The invention has particular application where the signal to be applied to the filter consists of a set of data obtained by sampling the amplitude of the signal at substantially equal time intervals, i.e.,



digitized data. In this context, I provide apparatus for extremely high speed digital filtering. Automatically the terms in the equation

$$y_n = \sum_{i=0}^{i=N} a_i x_{n-i} - \sum_{j=1}^{j=M} b_j y_{n-j}$$

are carried out by recursion, or a combination of feed forward and feed back terms. The quantities a_i and b_j are stored in a register. Values b_j are automatically called out as appropriate, multiplied by the previous values of the coefficient y_n, i.e., y_{n-j} (which is the recursive part) and summed, while the coefficients a_i are called out and multiplied by the appropriate value of x, then the total summation is made. The apparatus involves both storage means, means for reading out the various values involved, multiplying them together, accumulating them and using a recursive path by which input data can be re-stored in a particular register, as desired.

3,703,633

FLUIDIC COUNTER DEVICE

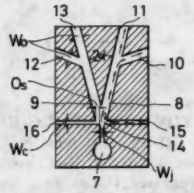
Kelichi Hanada, 28-14 Tamagawa 5-chome Todoroki-cho, Setagaya, Tokyo; Kimihiko Saito, 14-8 Mejiro 3-chome, Toshima-ku, Tokyo, and Akikazu Iwase, 19-8 Hiroh 5-chome, Shibuya-ku, Tokyo, all of Japan

Filed March 22, 1971, Ser. No. 126,574

Claims priority, application Japan, March 23, 1970, 45/23596

Int. Cl. G06d *1/10*

U.S. Cl. 235—201 PF **1 Claim**



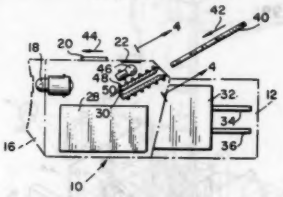
The present invention is to provide an improved fluidic counter device, wherein, instead of conventional devices, a pair of air suction ports are provided and preferably provided a pair of vents connected to respective output passages in order to obtain more stable characteristics than those of conventional device.

3,703,634

KEY HEATER FLASHLIGHT

Peter A. Bucky, 30 East 81st Street, New York, N.Y.

Filed April 15, 1971, Ser. No. 134,232
Int. Cl. F21l 7/00
U.S. Cl. 240—10.6 CH 22 Claims



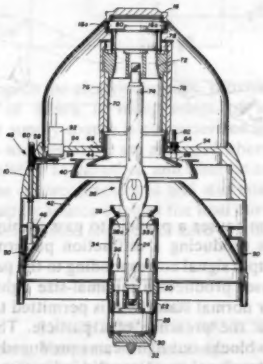
A key heater flashlight having a conventional flashlight circuit and a rechargeable power source. The flashlight also has a key slot around which a heating coil is deposed and into which the shank of a key can be inserted. Insertion of the key automatically turns on the key heater circuit; the heated key can be used to open a frozen lock such as an automobile lock. An indicating light and the heating coil current turn off automatically when the key is heated to a predetermined temperature. The unit is also provided with two batteries either of which can be selected for use in either the flashlight circuit or the heater circuit. This prevents the entire unit from suddenly becoming inoperative when the battery in use becomes discharged, particularly after a heavy current drain such as that which might be drawn by the heating coil.

3,703,635

ZOOM LIGHT

Jack L. Burkarth, Dallas, Tex., assignor to E-System Inc., Dallas, Tex.

Filed Sept. 8, 1970, Ser. No. 70,183
Int. Cl. F21v 7/00; G02b 5/10
U.S. Cl. 240—44.1 34 Claims



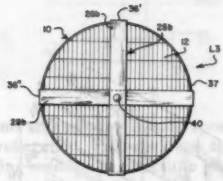
Multiple reflector elements of an optical system intercept rays emitted by an energy source for reflection into a beamwidth pattern varying from a spotlight configuration to a medium-width beam floodlight. Beamwidth variation is accomplished by adjusting the position of the reflector elements relative to each other in the optical system. Axial flow fans at both the supply and exhaust ends of coaxial ducts provide an airflow for both cooling the energy source (lamp) and the reflector elements of the optical system. In applications where selective radiation is required, a cylindrical filter assembly encloses the energy source to remove undesired portions of the spectral radiation before reflection from the optical system. The filter is extended or retracted from the area between the lamp and the reflector elements by remote control of electric actuators.

3,703,636

ANTI-FOG HEADLIGHT WITH OPAQUE MASK

Roman A. Schmitt, W255 S-4287 Oakdale Drive, Waukesha, Wis.

Filed April 7, 1971, Ser. No. 132,096
Int. Cl. F21v 11/02
U.S. Cl. 240—46.43 3 Claims



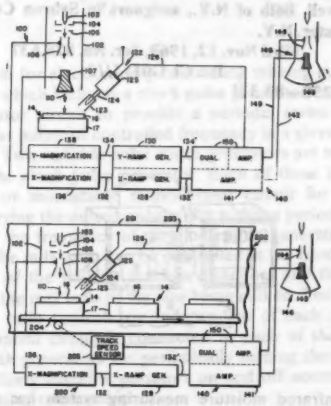
A sealed beam headlamp has a convex front transparent lens integrally joined peripherally to a parabolic reflector. An internal centered incandescent filament is carried by the reflector. An anti-fog mask is applied to the lens at either side or is embedded in the lens. The mask is a black, opaque member. It has arms crossed at a right angle. The arms extend across vertical and horizontal of the lens dividing it into four clear quadrants. The mask can be made of flexible, springy material removably held on the headlamp by flexible tabs at ends of the arms. The arms can be pivotally joined to each other.

3,703,637

ELECTRON BEAM INSPECTION

Allan Edward Dugan, Hopewell Township, Mercer County, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Nov. 23, 1970, Ser. No. 91,654
Int. Cl. G01n 23/04
U.S. Cl. 250—49.5 PE 4 Claims



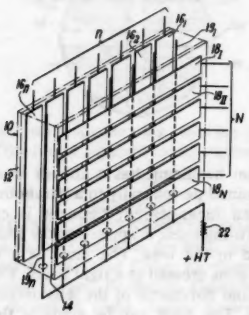
Differences between the secondary electron emission characteristics of two phases of the same material in response to bombardment by an electron beam are sensed to enable impurities, comprising one of the material's phases, in a sample, comprising the material's phase, to be detected. The electron beam is a low energy beam. Relative motion between the sample and the beam may be effected by sweeping the beam, by moving the sample, or by a combination of the two motions.

3,703,638

IONIZATION RADIATION DETECTOR SYSTEM FOR DETERMINING POSITION OF THE RADIATION

Robert Allemand, Grenoble; Christian Brey, Sassenage, and Jean Jacobe, Montbonnot, all of France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed May 22, 1970, Ser. No. 39,763
Claims priority, application France, May 23, 1969, 6917042
Int. Cl. G01t 1/18
U.S. Cl. 250—83.6 R 8 Claims



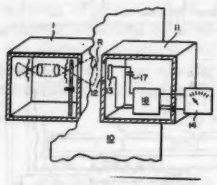
An X- and γ-radiation detector including a plurality of detecting cells. Each cell comprises an anode and two half-cathodes, the half-cathodes consisting of flat plates. The respective half-cathodes are arranged as othogonal elements so that by applying matrix technique the output of a particular cell can be selected to localize the radiation detected.

3,703,639

RADIATION MOISTURE MEASURING SYSTEM HAVING THERMOELECTRICALLY COOLED DETECTOR

Emannuel A. Paxhia, Churchville, and David A. Willett, Hopewell, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed Nov. 12, 1969, Ser. No. 875,637
Int. Cl. G01j 5/12
U.S. Cl. 250—83.3 H 15 Claims



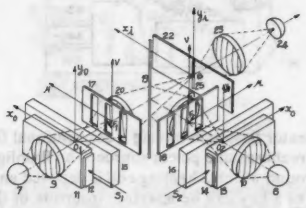
An infrared moisture measuring system has an infrared radiation sensing element. The sensing element is mounted on a thermo-electric cooler and is contained in a sealed housing. The housing has a window transparent to infrared radiation coming from a material containing moisture which affects the radiation. The housing contains a desiccant which absorbs any moisture that may be present in the housing, and is contained within an outer housing also having a window transparent to said radiation. The atmosphere within each of said housings is substantially the same as that external to the outer housing.

3,703,640

SIGNAL SPECTRAL MULTIPLEXING SYSTEM

Georges Broussaud, and Serge Lowenthal, both of Paris, France, assignors to Thomson - CSF

Filed Dec. 8, 1969, Ser. No. 882,880
Claims priority, application France, Dec. 17, 1968, 68178663
Int. Cl. H04b 9/00
U.S. Cl. 250—199 27 Claims



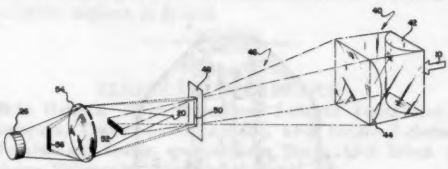
A double-diffraction optical system associated with a monochromatic light source, with optical-electrical modulating means and with photo-electric detector means, for effecting the interlaced spectral multiplexing or demultiplexing of a plurality of electrical signals.

3,703,641

PARTICLE-SIZE MEASURING APPARATUS

Fred D. Rosen, La Habra Heights, Calif., assignor to North American Rockwell Corporation

Filed Aug. 18, 1969, Ser. No. 850,725
Int. Cl. G01n 1/00, 15/02, 21/00
U.S. Cl. 250—218 5 Claims



This invention causes a particle to pass through an intense lightbeam, thus producing a diffraction pattern that is converted to an output signal corresponding to the particle-size. A plurality of lenses produces a minimal-size lightbeam that is blocked-out for normal states, but is permitted to produce an output signal at the presence of a particle. The optical arrangement also blocks-out lightbeams produced by dust, thus providing a better signal-to-noise ratio indication.

3,703,642

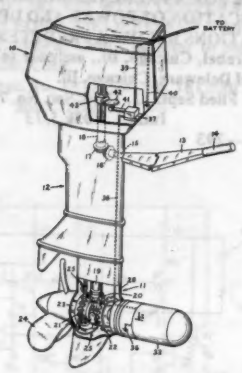
OUTBOARD MOTOR UNIT

Rodolfo Rodriguez Balaguer, 2607 Grace Drive, Harbor Beach, Fort Lauderdale, Fla.

Filed Oct. 28, 1971, Ser. No. 193,353
Int. Cl. F03b 13/10
U.S. Cl. 290—43 6 Claims

An outboard motor unit for use on small boats and having a primary propulsion engine connected through a clutch to the propeller shaft and an electric motor aligned with and connected to the propeller shaft. The electric motor is connected to a battery through a switch operatively connected to the en-

gine throttle to complete the power connection for the electric motor when the throttle is at a selected proportion of full



throttle. The electric motor operates as a motor when the engine is stopped and as a generator when the engine is running.

3,703,643

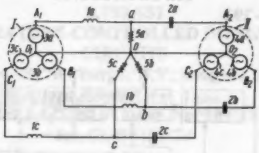
SUPPLY SOURCE FOR ELECTRICAL PLANTS, FURNISHING A CURRENT THE MAGNITUDE OF WHICH IS INDEPENDENT OF LOAD IMPEDANCE

Nikolai Fedotovich Ilinsky; Kirill Davidovich Gutterman, and Vadim Vladimirovich Mikhailov, all of Moscow, U.S.S.R., assignors to Moskovsky Ordena Levina Energetichesky Institut, Moscow, U.S.S.R.

Filed Feb. 25, 1971, Ser. No. 118,644

Int. Cl. H01j *3/38*

U.S. Cl. 307—52 **2 Claims**



Supply source for electrical plants, providing a current the magnitude of which is independent of load impedance, wherein the supply source is characterized in that it includes two voltage sources which are arranged whereby each may be regulated relative to the other, and wherein each is connected between one of two reactances and star connected with the load. The supply source enables the load current to be varied in any pre-determined manner for zero to a definite maximum value.

3,703,644

SYNCHRONIZING DEVICE

Kjeld Thorborg, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

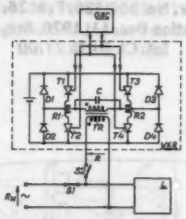
Filed March 9, 1972, Ser. No. 233,187

Claims priority, application Sweden, March 24, 1971, 3810/71

Int. Cl. H02j *7/00*

U.S. Cl. 307—64 **1 Claim**

A synchronizing device for achieving frequency and phase similarity between an output voltage from an inverter and the voltage from a second alternating voltage source includes an oscillator for delivering an output signal in the form of control pulses to the inverter, so that the input voltage of the inverter has a frequency corresponding to that of the control pulses. The second alternating voltage source supplies pulses to the oscillator to lock the output signal of the oscillator in frequency to the frequency of said alternating voltage source. The output signal of the oscillator is supplied to the inverter over a phase-shifting member. A phase-sensitive member is supplied with the output signal of the oscillator and the output of the inverter, and forms an analogue signal depending on the phase difference therebetween. This analogue signal is supplied to the phase-shifting member to affect the phase shifting so that the phase difference is steered towards zero.



3,703,645

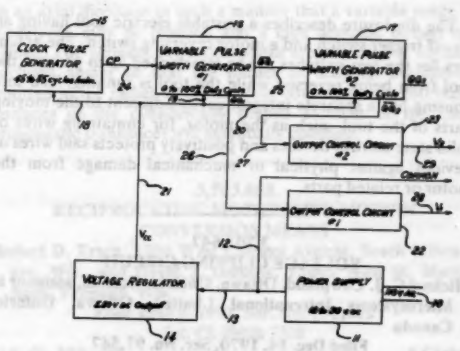
ELECTRONIC TIMING SYSTEM FOR MILKING

William C. Swift, P.O. Box 764, San Joaquin, Tex.

Filed Jan. 18, 1971, Ser. No. 107,111

Int. Cl. A01j *5/14*

U.S. Cl. 307—154 **8 Claims**



A system for electronically controlling milking machines is disclosed which includes a clock pulse generator employing a multivibrator circuit to provide a periodic series of stable rectangular pulses of controlled frequency in a given frequency range. Two variable pulse width generators are series coupled to the clock pulse generator. Each of these includes a one-shot or monostable multivibrator circuit for independently varying the output pulse width within a period as determined by the frequency of the clock pulse generator. In this manner, the milk ratio can be controlled at the front and rear solenoids of the milking machine pulsators and thus at the front and the rear teats of the cow being milked. The front and rear milk ratio controls are independent of each other. An output control circuit is connected to each of the variable pulse width generators for periodically turning the solenoids of the milking machine pulsators on and off according to a desired timing relationship.

A power supply, including a transformer and a rectifier, supplies a stepwise variable direct current voltage to a voltage regulator for supplying a constant voltage to the clock pulse generator and the two variable pulse width generators for stabilized pulse output isolated from variations in power input line voltages. The power supply also provides a common voltage between the solenoids of the milking machine pulsators and the two output control circuits.

3,703,646

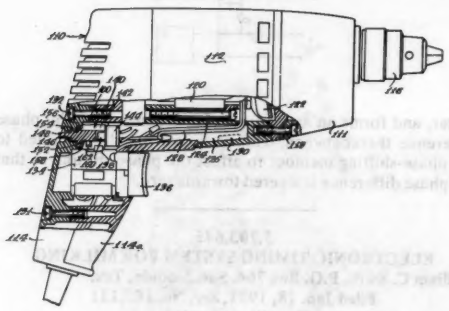
ELECTRIC TOOL WITH TRIGGER SWITCH AND LOCK-OUT ARRANGEMENT

Anthony Jacyno, Aurora, Ill., assignor to G. W. Murphy Industries, Inc., Portable Electric Tool Division, Houston, Tex.

Continuation of Ser. No. 800,526, Feb. 26, 1969, abandoned. This application Dec. 11, 1970, Ser. No. 97,306

Int. Cl. H02k 11/00

U.S. Cl. 310—47 3 Claims



The disclosure describes a portable electric tool having an on-off trigger switch and a motor reversing switch. The actuators for the two switches are so interlocked as to prevent the tool from being reversed while the tool is running. The tool housing has a separate integral cavity adjacent to the moving parts of the tool, such as the motor, for containing wires or solid state control devices and positively protects said wires or devices against physical or mechanical damage from the motor or related parts.

3,703,647

VOLTAGE CLIPPING CIRCUIT

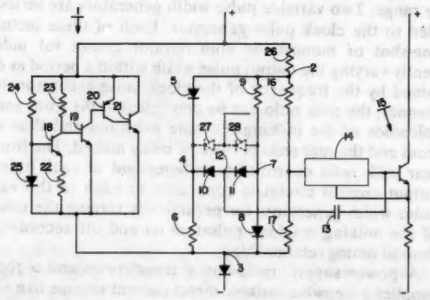
Michael C. J. Cowpland, Ottawa, Ontario, Canada, assignor to Microsystems International Limited, Ottawa, Ontario, Canada

Filed Dec. 14, 1970, Ser. No. 97,547

Claims priority, application Canada, Dec. 10, 1970, 100,304

Int. Cl. H03k 17/00

U.S. Cl. 307—237 6 Claims



A temperature-stable voltage clipping circuit, in which changes in voltage clipping levels caused by temperature-induced variation in the transfer characteristics of the clipping diodes are cancelled out.

3,703,648

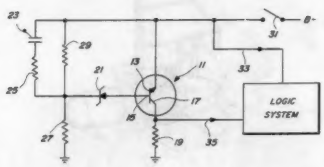
RESET CIRCUIT FOR LOGIC SYSTEM IN QUIESCENT STATE FOR A PREDETERMINED TIME UPON APPLICATION OF POWER AND UPON POWER FLUCTUATIONS BELOW A PREDETERMINED LEVEL

James A. Wrabel, Chicago, Ill., assignor to The Seeburg Corporation of Delaware, Chicago, Ill.

Filed Sept. 11, 1970, Ser. No. 71,621

Int. Cl. H03k 5/13

U.S. Cl. 307—293 2 Claims



A Zener diode is placed in series with the base of a transistor, which provides a reset signal when not conducting, to prevent conduction of the transistor until the breakdown voltage of the Zener is exceeded. An RC charging circuit is utilized to delay breakdown of the Zener diode for a specified time period after application of power to the system.

3,703,649

TIMER FOR A CAMERA

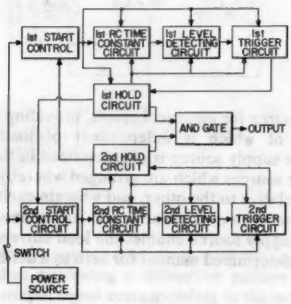
Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku, K.K., Tokyo, Japan

Filed Sept. 29, 1971, Ser. No. 184,781

Claims priority, application Japan, Sept. 30, 1970, 45/85415

Int. Cl. H03k 5/13

U.S. Cl. 307—293 10 Claims



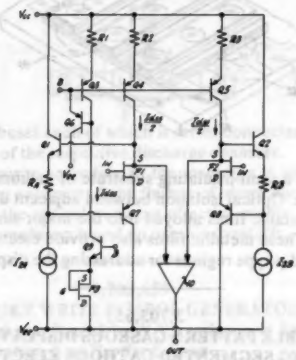
A timer circuit for actuating a camera including first and second timing circuits and first and second start control circuits. Each timing circuit consists of an integration time constant circuit having a resistor and a capacitor connected in series, a level detecting and trigger circuit and a hold circuit. The first and second start control circuits are interconnected between a power source and the first and second timing circuits, respectively, in such a manner that each start control circuit is connected or disconnected by a control signal derived from the other start control circuit. The timing circuits are alternately actuated by said start control circuits, and the outputs from the two timing circuits are applied to an AND gate to generate an actuating signal for controlling the camera. Switches are provided in the timer circuit so as to selectively establish said timer circuit in one of various modes of operation.

3,703,650

INTEGRATED CIRCUIT WITH TEMPERATURE COMPENSATION FOR A FIELD EFFECT TRANSISTOR

Larry J. Kendall, Concord, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Sept. 16, 1971, Ser. No. 181,090
Int. Cl. H03k 23/08
U.S. Cl. 307—310 5 Claims



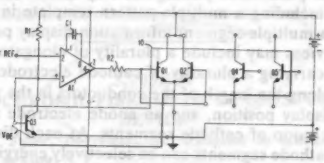
An integrated circuit with temperature compensation being provided for field effect transistors by a matched FET which provides an I_{dss} which varies with temperature and which determines the drain current of the temperature compensated field effect transistors.

3,703,651

TEMPERATURE-CONTROLLED INTEGRATED CIRCUITS

William L. Blowers, Newburgh, N.Y., assignor to Kollmorgen Corporation, Hartford, Conn.

Filed July 12, 1971, Ser. No. 161,512
Int. Cl. H01l 1/24
U.S. Cl. 307—310 2 Claims



An integrated circuit comprising several transistors on a chip is maintained at a constant temperature by utilizing certain of the transistors as heating elements and other transistors as temperature sensors in a closed loop feedback network. The remaining transistors—not thus utilized for temperature regulation and sensing are available for use in work circuits where sensitivity to ambient temperature variations or self-heating present design problems.

ERRATUM

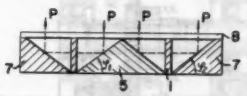
For Class 310—47 see:
Patent No. 3,703,646

3,703,652

ELECTROACOUSTIC TRANSDUCER

Masahiro Noda, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1971, Ser. No. 117,619
Claims priority, application Japan, Feb. 25, 1970, 45/16082
Int. Cl. H04r 17/00
U.S. Cl. 310—8.3 3 Claims



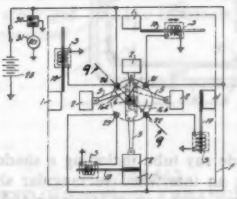
An electroacoustic transducer includes an electroacoustic transducer element and inner and outer acoustical reflection plates respectively positioned within an exterior to the transducer element. The electroacoustic transducer element emits an acoustic signal, such as an ultrasonic wave, from both the inner and outer surfaces of the element by expansion and contraction oscillations caused by an electrical signal applied thereto. Similarly, the transducer element can generate an electrical signal by applying an acoustical oscillation thereto. The inner and outer acoustical reflection plates will reflect acoustic oscillations emitted from the inner and outer surfaces in an axial direction in such a manner that a variable range of directivity may be realized and a high acoustic output obtained. The acoustic reflection plates are provided at suitable inclined angles so that the phases of acoustic oscillations emitted in the radial direction from both the inner and outer surfaces of the cylindrically shaped element of the electroacoustic transducer will essentially coincide.

3,703,653

RECIPROCATING MOTOR WITH MOTION CONVERSION MEANS

Robert D. Tracy, 1506 West Chicago Avenue, South Milwaukee, Wis., and David J. Derouin, 12045 West St. Martin Road, Franklin, Wis.

Filed June 9, 1971, Ser. No. 151,462
Int. Cl. H02k 7/06
U.S. Cl. 310—24 6 Claims

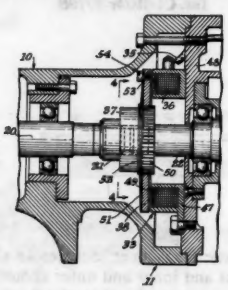


A permanent magnet motor which utilizes pairs of permanent magnets as the power source for the motor. The magnets of each pair are arranged with their like poles adjacent one another so that normally the magnets of the pairs oppose or repel one another. Shiftable means are provided for being inserted between the magnets of each pair so as to then to alter the magnetic field between the magnets to cause the magnets to move toward one another with considerable force. One magnet of each pair is connected to a common drive shaft member. The shiftable means for being inserted between and withdrawn from the magnets of each pair are shifted by any suitable means in timed relationship with one another.

3,703,654
HAND TOOL WITH MAGNETIC BRAKE

Ralph Karubian, 2001 West Gage Avenue, Los Angeles, Calif.

Filed June 30, 1971, Ser. No. 158,268
Int. Cl. H02k 7/10
U.S. Cl. 310—77 5 Claims

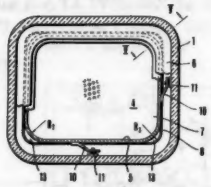


A hand tool having a motor-operated shaft that drives a saw, the motor being rendered operable when pressure is applied to a trigger while a tool-manipulating handle is being grasped. Said tool is provided with a magnetic brake that comprises an electro-magnetic coil affixed to the housing of the tool and an armature normally biased away from the coil carried by and rotatable with the shaft, the coil remaining de-energized during operation of the shaft and saw. Said actuator, upon release of the trigger, shifting a switch to cause de-energization of the motor and energization of the electro-magnetic coil to produce a magnetic field effective on the armature to draw it into braking engagement with a brake lining provided adjacent the coil.

3,703,655
COLOR CATHODE RAY TUBES OF THE SHADOW MASK TYPE

Takao Kawamura, Chiba-ken, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 7, 1971, Ser. No. 104,561
Claims priority, application Japan, Jan. 7, 1970, 45/2147
Int. Cl. H01j 29/46, 29/56
U.S. Cl. 313—85 S 7 Claims



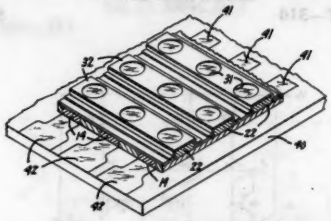
In a color cathode ray tube including a shadow mask assembly comprising an interfitted rectangular shadow mask and supporting frame, each having four rounded corners, the radius of curvature of the four rounded corners of the side wall of the shadow mask is made smaller than that of the four rounded corners of the supporting frame.

3,703,656
MONOLITHIC SEMICONDUCTOR DISPLAY DEVICES

Allen M. Barnett; Simeon V. Galginaitis, both of Schenectady, and Frederick K. Heumann, Burnt Hills, all of N.Y., assignors to General Electric Company

Filed Feb. 17, 1971, Ser. No. 116,005
Int. Cl. H01j 1/62
U.S. Cl. 313—108 D 11 Claims

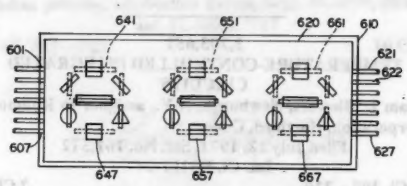
Monolithic semiconductor arrays of light-emitting diodes and methods for making them on optically transparent semi-insulating substrates, for example, with means for providing optical isolation between adjacent diodes are described. In one embodiment, a monolithic matrix-addressable alphanumeric display device is formed by selective liquid epitaxial growth of n- and p-type gallium phosphide semiconductor material on a semi-insulating substrate of gallium phosphide, for example. Optical isolation between adjacent diodes is provided by metallic films alloyed into the major surfaces of the substrate. These metallic films also provide electrical contact to the n- and p-type regions for addressing the display device.



3,703,657
VARIABLE PATTERN GASEOUS DISPLAY PANEL HAVING SEGMENTED CATHODE ELECTRODES

Arthur B. Shesser, Plainfield, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 45,200, June 10, 1970, abandoned. This application Feb. 11, 1971, Ser. No. 114,595
Int. Cl. H01j 61/30, 61/66
U.S. Cl. 313—109.5 17 Claims



Display devices adapted to display one or more patterns, symbols, or portions of patterns side-by-side in one or more rows and including a multiple-pattern template in combination with a multiple-segment information display panel. Such display devices may include a plurality of elongated conductors each carrying a plurality of cathode electrode segments disposed along the length of the conductors in the panel, one at each display position, and an anode electrode associated with each group of cathode segments. At each display position, the cathode segments can be selectively energized to display selected patterns or any desired portions of the patterns or symbols provided by the template format.

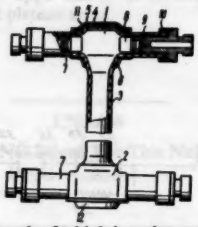
3,703,658
GAS-DYNAMIC DISCHARGE LIGHT SOURCE

Viktor Viktorovich Sysun, korpus 707, kv. 71; Boris Vasilievich Skvortsov, korpus 511, kv. 58; Jury Georgievich Basov, korpus 309, kv. 32, and Vladimir Ivanovich Roldugin, korpus 347, kv. 34, all of Moscow, U.S.S.R.

Filed Dec. 3, 1970, Ser. No. 94,744
Claims priority, application U.S.S.R., Dec. 24, 1969, 1388550
Int. Cl. H01j 61/30, 61/40
U.S. Cl. 313—113 8 Claims

The present invention relates to light-source in which light emission in the optical wavelength range is produced by mov-

ing shock waves and plasma streams. According to the invention, a gas-dynamic discharge light-source comprises at least two gas-filled discharge chambers interconnected by a tube in which shock waves and the gas-discharge plasma are propagated. On the outside, the discharge chambers have current-carrying buses each of which is series-connected with the discharge gap of the respective discharge chamber.



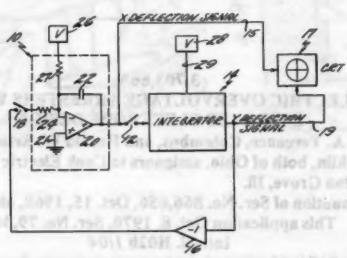
The light source according to the invention is intended to produce strong recurrent light flashes of short duration, for use mainly in the optical pumping of active media, predominantly liquid-type lasers based on organic dyestuffs.

3,703,659

STROKE WRITE SYMBOL GENERATOR

Glenn C. Waehner, Scarsdale, N.Y., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed Dec. 24, 1970, Ser. No. 101,236
Int. Cl. H01j *29/70*
U.S. Cl. 315—24 **1 Claim**



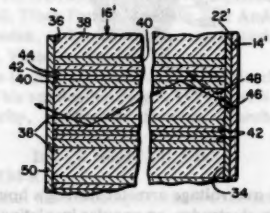
A stroke generator in a CRT display uses two integrators to generate straight lines for X and Y deflections respectively, and uses the same two integrators connected by simple switches as a harmonic oscillator to generate circular arcs.

3,703,660

PHOTOCHROMIC FIBER OPTIC IMAGE STORAGE DEVICE

Norman F. Fyler, Deerfield, Ill., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 19, 1971, Ser. No. 173,180
Int. Cl. G02b *5/16*; H01j *29/14*, *31/10*
U.S. Cl. 313—92 LF **25 Claims**



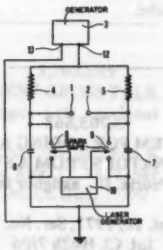
Disclosed is a fiber optic image storage device of the type having a plurality of light-conducting optical fibers secured together in side-by-side relation so that corresponding opposite ends of the fibers cooperate to define first and second faces. Each of the fibers is characterized in that it comprises a glass core and a layer of photochromic glass formed upon the surface of the core. The layer of photochromic glass may function as a sheath having a refractive index substantially the same as that of the core, or it may have a refractive index lower than that of the core thereby forming with the core a light reflecting interface. The core may consist of a photochromic glass or a non-absorbing glass.

3,703,661

GENERATOR FOR DELIVERING VERY-HIGH-VOLTAGE SQUARE-TOPPED PULSES

Denis Le Goff, Enghien, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed May 24, 1971, Ser. No. 146,131
Claims priority, application France, May 28, 1970, 7019553
Int. Cl. H01t *15/00*; H03k *3/53*
U.S. Cl. 315—155 **5 Claims**



A square-topped voltage pulse having a very fast rise time and fall time is obtained between the two terminals of a load by means of a generator comprising a first and a second voltage source which remain connected to the two terminals and two devices for rapid circuit-closure which are connected between ground and said terminals and at least one of which consists of a spark-gap, said two terminals being connected to ground in succession.

3,703,662

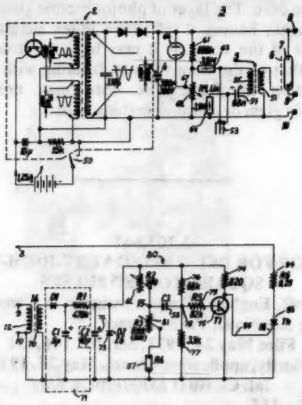
HIGH SPEED QUENCHING ARRANGEMENT FOR A FLASH DEVICE

Rolf Dieter Dennewitz, and Lutz Breitkreuz, both of Berlin, Germany, assignors to Loewe Opta G.m.b.H., Berlin, Germany

Filed Dec. 5, 1969, Ser. No. 882,689
Claims priority, application Germany, Dec. 11, 1968, P 18 14 856.5
Int. Cl. H05b *37/02*
U.S. Cl. 315—159 **3 Claims**

A pulsed flash unit is provided with a photoelectrically controlled, interruptible thyristor gate whose transconductive path is connected in shunt with the flash tube for instantaneously quenching the light output from the flash tube when a predetermined quantity of emitted light has been monitored

and integrated by the unit. A threshold-regulated transistor coupled to the output of the light integrator supplies a two-



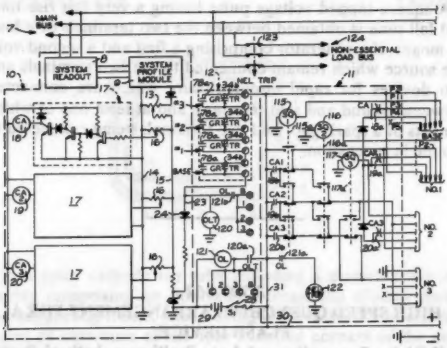
state control voltage to the control electrode of the thyristor so that the latter selectively provides a short and an open circuit across the flash tube.

3,703,663

CONTROL SYSTEM FOR ADDING AND REMOVING ALTERNATORS FROM A SYSTEM

Harold H. Wagner, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 10, 1971, Ser. No. 179,282
Int. Cl. H02h 7/06
U.S. Cl. 317—13 R 8 Claims



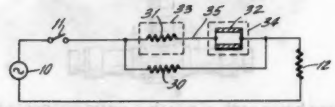
An automatic control system for a plurality of engine powered alternator units arranged to supply a common electrical distribution system wherein the alternators are driven by speed governed engines which employs circuitry which adds or removes units as the electrical load varies, calls all non-operating units when an overload is approached and removes any malfunctioning alternator unit due to mechanical and/or electrical malfunctions in the unit by employing voltage signals from commercial load profile modules for control functions and voltage signals from the engine governors.

3,703,664

FAULT CURRENT LIMITER USING SUPERCONDUCTIVE ELEMENT

John C. Cronin, Greensburg, Pa., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Oct. 5, 1970, Ser. No. 77,837
Int. Cl. H02h 9/02
U.S. Cl. 317—20 5 Claims



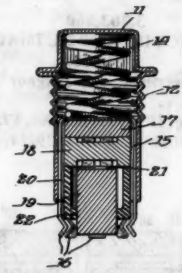
A superconductive impedance element is connected in parallel with a conventional impedance element and is switched from essentially zero impedance to a high impedance during switching operation, thereby to connect the conventional impedance in the circuit to limit the current in the circuit. The impedances switched into the circuit are inductively associated with the superconductive element. A pilot superconductive element is disclosed for the high accuracy switching of a main superconductive element.

3,703,665

ELECTRIC OVERVOLTAGE ARRESTERS WITH IMPROVED ELECTRODE DESIGN

Robert A. Yereance, Columbus, and Harold W. Erlenbach, Jr., Franklin, both of Ohio, assignors to Cook Electric Company, Morton Grove, Ill.

Continuation of Ser. No. 866,656, Oct. 15, 1969, abandoned.
This application Oct. 8, 1970, Ser. No. 79,341
Int. Cl. H02h 1/04
U.S. Cl. 317—61 13 Claims



An electric overvoltage arrester having a housing, a pair of spaced carbon electrodes, an annular insulating spacer within the housing and an assembly carried by the housing to hold the

electrodes and spacer within the housing is provided for use in protecting electrical transmission lines from in-line voltage surges. One of the electrodes is recessed within the annular insulating spacer to define a gap distance between the opposing faces of the electrodes and the second electrode has a plurality of grooves cut in its upper and lower surfaces to define a pattern of grooves and plateau areas.

3,703,666

Patent Not Issued For This Number

3,703,667

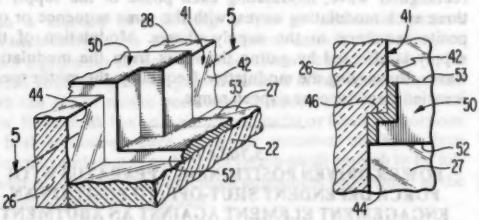
SHAPED RISER ON SUBSTRATE STEP FOR PROMOTING METAL FILM CONTINUITY

Andrew Gordon Francis Dingwall, Somerset, N.J., assignor to RCA Corporation

Filed March 17, 1971, Ser. No. 125,302

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 317—234 R **11 Claims**



In integrated circuit devices which have insulating coatings with portions of different thickness bounded by relatively high steps and deposited metal conductors on the coatings, yield losses often result from breaks in the metal conductors at the steps. By shaping the insulator step with an offset wherever a metal crossing is required, the probability of such breaks is reduced.

3,703,668

SEMICONDUCTOR DEVICE WITH SEMICONDUCTOR ELEMENTS ARRANGED SIDE BY SIDE AND PROVIDED WITH HOLLOW COOLING BODIES

Per-Ake Bylund; Tibor Farkas, and Nils Eric Andersson, all of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

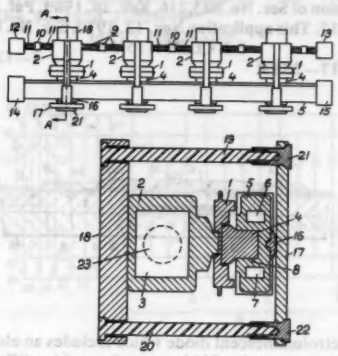
Continuation-in-part of Ser. No. 121,978, March 8, 1971, abandoned. This application July 9, 1971, Ser. No. 161,199

Claims priority, application Sweden, March 23, 1970, 3973/70

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 317—234 R **3 Claims**

A semiconductor device comprises semiconductor elements arranged side by side and provided with hollow cooling bodies. The cooling bodies are joined to each other by a connection conduit for the coolant which is flexible and which insulates the cooling bodies from each other electrically. The connection conduit comprises a tube of insulating inorganic material and a bellows of metallic material fixed to each end of the tube.



3,703,669

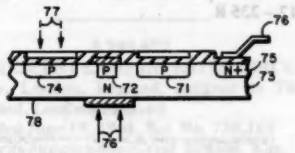
PHOTOCURRENT CROSS TALK ISOLATION

Arnold London, Tempe, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of Ser. No. 797,202, Feb. 6, 1969, abandoned. This application Aug. 12, 1971, Ser. No. 171,300

Int. Cl. H01l *15/00*

U.S. Cl. 317—235 R **10 Claims**



A monolithic photoresponsive array having a plurality of spaced-apart photocurrent collecting regions (photocells) extending into a semiconductor substrate from one major surface. Cross talk caused by lateral flowing of photocurrents between the various photocurrent collecting regions is substantially decreased (such decrease termed photocurrent isolation) by establishing a concentration of minority carriers effectively intermediate the photocurrent collecting regions which is substantially lower than the minority carrier concentration of the semiconductor material in which such photocurrents are flowing. In one embodiment, a region having the same conductivity type as the various photocurrent collecting regions is disposed between adjacent ones thereof and is short-circuited to the substrate such that the minority carrier concentration adjacent the shorted junction is equal to the thermal equilibrium minority carrier concentration. Such photocurrent isolation may be provided within islands of an integrated circuit die or chip having a plurality of such photocurrent collecting regions. Groups of such photocurrent collecting regions may be electrically isolated as by dielectric isolation or through junction isolation.

3,703,670

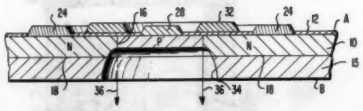
ELECTROLUMINESCENT DIODE CONFIGURATION AND METHOD OF FORMING THE SAME

Hans J. Kunz, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 803,216, Feb. 28, 1969, Pat. No. 3,667,117. This application Nov. 12, 1970, Ser. No. 89,015

Int. Cl. H011 *15/00*

U.S. Cl. 317—235 R 7 Claims



An electroluminescent diode which includes an electromagnetic radiation emitting PN junction formed by diffusing, into both surfaces of a semiconductor slice of a first conductivity, a dopant material of opposite type conductivity. Contact metallizations are mounted within windows in an insulating barrier which covers said diode so as to form electrical contacts engaging both the N and P type areas of the diode. An annular reflector metallization pad is mounted on the surface of the device over the PN junction and spaced from one surface of the semiconductor material by the insulating coating so as to reflect light out through the surface opposite to that on which an anti-reflection coating has been placed.

3,703,671

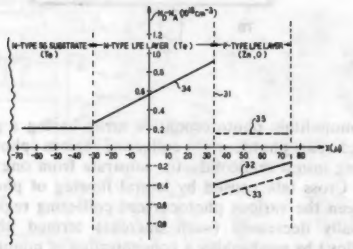
ELECTROLUMINESCENT DEVICF

Robert H. Saul, 1 Clinton Lane, Scotch Plains, N.J.

Division of Ser. No. 848,546, Aug. 8, 1969. This application March 10, 1972, Ser. No. 233,680

Int. Cl. H011 *15/00*

U.S. Cl. 317—235 R 2 Claims



The efficiency of gallium phosphide electroluminescent devices, emitting light in the red region of the spectrum, produced by the liquid phase epitaxial deposition of p-type material on an n-type substrate depends in part on the concentration of zinc and oxygen in the gallium solvent used in the deposition and on the heat treatment after deposition. It has been found that inclusion in the gallium of 0.03 mole percent zinc and 0.35 mole percent Ga_2O_3 lead to the production of mounted devices of greater than 6 percent photon efficiency when junction formation is followed by a suitable heat treating schedule.

3,703,672

THREE-PHASE INDUCTION-MOTOR, SPEED-CHANGING METHOD AND CONTROL CIRCUIT

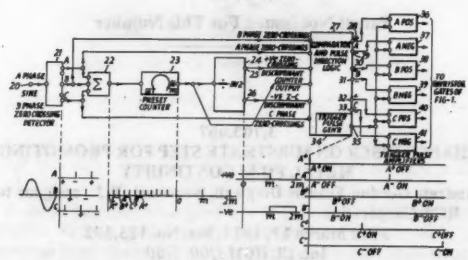
Brian Michael Bird, and Gordon Hindle Rawcliffe, both of Bristol, England, assignors to National Research Development Corporation

Filed April 26, 1971, Ser. No. 137,533

Claims priority, application Great Britain, May 5, 1970, 21,653/70

Int. Cl. H02p *5/40*

U.S. Cl. 318—227 16 Claims



A method of changing the speed of a three-phase induction motor by deriving from the A.C. supply a modulating wave of sub-multiple frequency, deriving therefrom a corresponding rectangular wave, modulating each phase of the supply by three such modulating waves, with the same sequence or opposite sequence to the supply phases. Modulation of the supply is effected by gating thyristors from the modulating waves. By varying the modulation frequency, the motor speed is varied stepwise over a speed range.

3,703,673

POWER DRIVEN POSITIONING APPARATUS WITH FORCE DEPENDENT SHUT-OFF, TO POSITION AN ENGAGEMENT ELEMENT AGAINST AN ABUTMENT

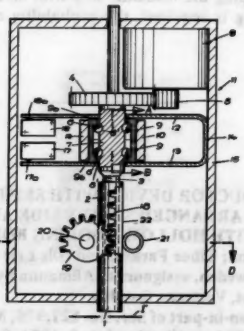
Jurgen Balz, Heilbronn, Neckar, Germany, assignor to Firma Helmut Balz GmbH, Heilbronn, Neckar, Germany

Filed Nov. 19, 1971, Ser. No. 200,453

Claims priority, application Germany, July 14, 1971, P 21 35 094.7

Int. Cl. H02p *3/00*

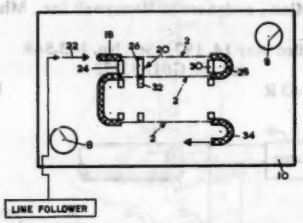
U.S. Cl. 318—468 10 Claims



A housing, preferably separable into shells encloses a generally U-shaped leaf spring, having projecting legs extending into the housing. A spindle passes through the projecting legs, the spindle being motor driven and connected by threads with the engagement element to provide axial movement of the engagement element upon rotation of the spindle. The spindle is guided in the housing by a sleeve formed in the hous-

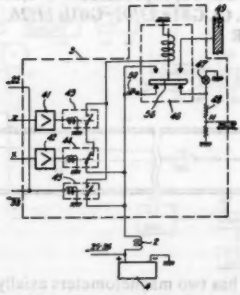
ing which surrounds axially movable bearings. The bearings are held in axial position by the leg portions of the U-shaped spring, but following axial excursion of the spindle, if the engagement element connected thereto strikes an abutment, causing deflection of the leaf spring and operation of electrical switches as the leg portions of the leaf springs deflect.

3,703,674
LINE FOLLOWING
Brian Cecil Doxey, Welwyn, England, assignor to The British Oxygen Company Limited, London, England
Filed Nov. 9, 1970, Ser. No. 88,151
Claims priority, application Great Britain, Nov. 14, 1969, 56,000/69
Int. Cl. G05b 19/36
U.S. Cl. 318—577 4 Claims



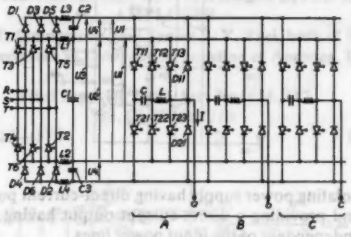
In a method of following a line or silhouette pattern photoelectrically, in order to control associated cutting or other equipment corners or crossovers which are unable to be traced accurately in one pass are traced in two or more passes with the aid of masks positioned in succession over the pattern. Each mask has on it additional paths or blanking portions or both to convert each corner or crossover on the pattern into an unambiguous path of curvature small enough to be followed accurately. The associated equipment is inhibited as the additional paths are followed.

3,703,675
FLOATING BATTERY CHARGING NETWORK
Andre A. L. Airic; Gilbert R. A. Porte; Joseph M. H. Glotin; Francis J. Higounenq, all of Hte Garonne, and Serge P. Boussin, Cordeille-Cornebarieu, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France
Filed Feb. 17, 1971, Ser. No. 116,175
Claims priority, application France, Feb. 25, 1970, 7006723
Int. Cl. H02j 7/34
U.S. Cl. 320—31 27 Claims



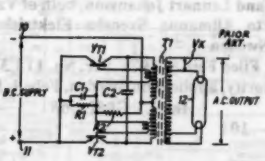
Method and apparatus for charging storage batteries and discharging same into a network through a contactor controlled by comparing network voltage with a reference voltage and battery off-load voltage with a reference voltage and a clock to cut off charging after a predetermined time to limit battery charge to 95% of its rated capacity.

3,703,676
INVERTER
Kjell Frank, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed May 7, 1971, Ser. No. 141,177
Claims priority, application Sweden, May 15, 1970, 6688/70; Dec. 16, 1970, 17026/70
Int. Cl. H02m 7/48
U.S. Cl. 321—5 2 Claims



An inverter has a connection group arranged to be fed with DC voltage and which includes two controlled main rectifiers in series with each other connected to the DC source and a connection point between which forms the output terminal for the output voltage of the inverter. These rectifiers are fired alternately. Two controlled commutating rectifiers in series are arranged to be supplied with DC voltage and are fired alternately in order to extinguish the main rectifiers. A commutating capacitor and a reactance are connected in series between the connection point of the main rectifiers and a point between the commutating rectifiers. An inductive element is connected with the capacitor to form an oscillating circuit so as to recharge the capacitor at each commutation. A series connection including the commutating rectifiers is supplied with positive and negative DC voltage of higher and lower potential respectively than that of the positive and negative poles of the first DC source. A limiting rectifier having such polarity that it is made reverse blocking by the voltage of the first DC source is connected between each pole of the first DC source and the terminal of the commutating capacitor facing the AC output.

3,703,677
FLUORESCENT LAMP INVERTER CIRCUIT
Victor Farrow, London, England, assignor to Thorn Electronics Limited, London, England
Filed June 19, 1968, Ser. No. 738,165
Claims priority, application Great Britain, Aug. 11, 1967, 37,083/67
Int. Cl. H02m 7/52
U.S. Cl. 321—45 R 1 Claim



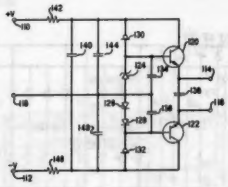
There is disclosed an inverter circuit particularly, but not exclusively, for operating fluorescent lamps. This circuit has a transformer to the primary of which is to be supplied a periodically switched D.C., a load being connected across the secondary. The transformer has an annular core having at least one air gap in it and two limbs projecting towards one another from opposing parts of the annulus and separated by an air gap. The primary and secondary windings surround the annulus on opposite sides of the limbs.

3,703,678

ISOLATING POWER SUPPLY

David Reis Weller, Bernardsville, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, Berkeley Heights, N.J.

Filed May 12, 1971, Ser. No. 142,628
Int. Cl. G05f 3/14
U.S. Cl. 323—19 4 Claims



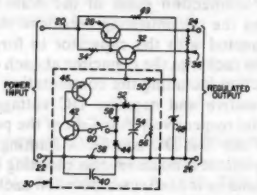
An isolating power supply having direct-current power as its input and providing a direct-current output having a ground that is independent of the input power lines.

3,703,679

CURRENT REGULATOR WITH DELAYED TURN-OFF

Marvin W. Heidt, Marion, Iowa, assignor to Collins Radio Company, Dallas, Tex.

Filed Oct. 28, 1971, Ser. No. 193,296
Claims priority, application Sweden, Feb. 9, 1970, 1580/70
Int. Cl. G05f 1/58
U.S. Cl. 323—9 5 Claims



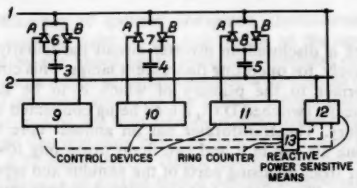
A voltage regulator with delayed current turn-off characteristics particularly useful with capacitive loads and including a load current control transistor, control circuitry for the current control transistor, and load current sensing circuitry the control circuitry being responsive to excess load current and biasing the load current control transistor to limit current. Transistor circuitry is provided within the control circuitry whereby continued excess current for a predetermined period of time will remove the power supply by interrupting the current to the load.

3,703,680

CAPACITOR BANK FOR AC NETWORKS

Kjell Frank, and Lennart Johansson, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Feb. 8, 1971, Ser. No. 113,316
Claims priority, application Sweden, Feb. 9, 1970, 1580/70
Int. Cl. G05f 1/68
U.S. Cl. 323—101 8 Claims



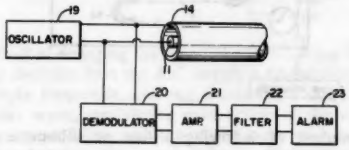
A capacitor bank for alternating current networks has a number of parallel branches each of which is connected by antiparallel-connected thyristors to the network. There is a control device for each thyristor which, when the bank is fully loaded, connects the thyristors in one conducting direction or the other in synchronism with the maximum of the network voltage in such direction. Each branch of the bank can be recharged by the full load during each half-period of the network voltage. Upon the occurrence of reduced load on the bank, the control devices emit current pulses to connect the thyristor switches in one direction or the other of the maxima of the network voltage in such direction for recharging. These latter pulses are emitted at a frequency which is substantially less thaN the network frequency.

3,703,681

THIN FILM LINE SENSOR FOR MEASURING MAGNETIC FIELDS, PRESSURE, VIBRATION OR PHYSICAL DISPLACEMENT

Gary N. Johnson, Rapid City, S. Dak., and Larry E. Wilson, Excelsior, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 14, 1971, Ser. No. 143,548
Int. Cl. G01r 33/02
U.S. Cl. 324—43 R 10 Claims



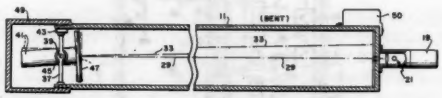
A line sensor which utilizes a ferromagnetic coated conductor in combination with another conductor in a line transducer. The line sensor is responsive to stress and to the ambient magnetic field. The impedance of the line transducer varies in accordance with the stress thereon and also in accordance with changes in the ambient magnetic field. A driving signal is introduced into the line transducer and a monitoring circuit detects the variations in the impedance of the line transducer. This enables the line sensor to indicate either individually or in combination disturbances in the ambient magnetic field, seismic movement, and differential displacement of the line transducer due to pressure upon the medium containing the line transducer.

3,703,682

LONG AXIS GRADIOMETER

Miles X. Wickman, Edgewater, and Harold P. Cohn, Shadyside, both of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Oct. 30, 1968, Ser. No. 771,800
Int. Cl. G01r 33/02; G01b 11/26
U.S. Cl. 324—43 R 5 Claims



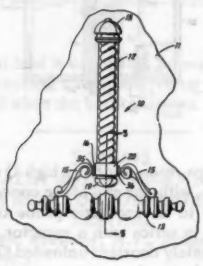
A gradiometer has two magnetometers axially spaced apart by an internally non-reflecting tube. One magnetometer is attached to a light source fixed centrally of a photo multiplier array at one end of the tube. The source transmits collimated or cophasal light to the other end of the tube where it is reflected by a mirror mounted on a two axis gimbal. The other magnetometer is attached to the gimbal. The reflected light returns to the source if the magnetometers are coaxial when

the magnetometer axes are not parallel, the reflected light is sensed by the photomultiplier array the outputs of which drive a servo to realign the gimbaled mirror/magnetometer arrangement to parallelism so that sensed earth's field components are eliminated during operational use of the magnetometers as a gradiometer.

3,703,683
LIMITED PIVOTAL HANDLE ASSEMBLY FOR FURNITURE COMPONENTS

Ted Ciepley, Evansville, Ind., assignor to Bliss & Laughlin Industries, Incorporated, Oak Brook, Ill.

Filed April 2, 1970, Ser. No. 25,032
Int. Cl. A47b *95/02*
U.S. Cl. 16—126 **3 Claims**

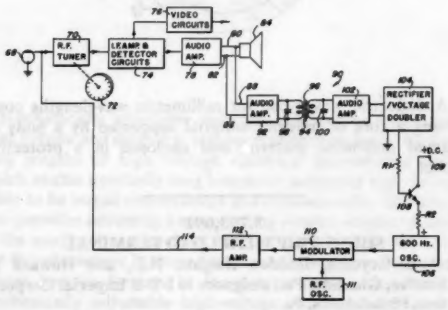


A handle assembly mounted to a drawer front or the like having a handle with limited pivoting capability. The handle assembly has a handle connected to a base by means of a pair of arms connected to either end of a shaft. The arms have cam shaped members with recesses for resting against lugs mounted on the base. The shaft has a boss for resting against a flat surface located within the base. The cam shaped members and boss prevent the handle from pivoting sufficiently down to damage the furniture surface.

3,703,684
CHANNEL MONITORING SYSTEM FOR AUDIENCE SURVEY PURPOSES

David S. McVoy, Sarasota, Fla., assignor to Coaxial Scientific Corporation, Sarasota, Fla.

Filed Jan. 25, 1971, Ser. No. 109,162
Int. Cl. H04h *1/04*; **H04b** *3/46*
U.S. Cl. 325—31 **4 Claims**

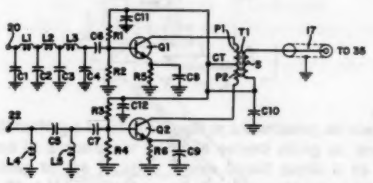


A coaxial cable system for television communications or the like comprises an arrangement for sending a control signal selectively on the audio sub-carrier of each of a number of television channels. Receivers connected to the cable have circuitry for detecting the presence of the control signal when tuned to a channel over which the control signal is being sent. Each receiver has monitor signal generating circuitry that transmits a unique monitoring signal responsive to detection of the control signal. The monitoring signal is transmitted to monitoring circuitry at the headend of the cable, and the monitoring circuitry detects the presence or absence of the monitoring signal from each receiver, thereby indicating if the receiver is tuned to a particular channel.

3,703,685
MULTIBAND ANTENNA WITH ASSOCIATED R.F. AMPLIFIER

Nicholas T. Simopoulos, and James B. Y. Tsui, both of Dayton, Ohio, assignors to Labtron Corporation of America, Dayton, Ohio

Filed Sept. 10, 1969, Ser. No. 856,717
Int. Cl. H04b *1/16*
U.S. Cl. 325—373 **1 Claim**

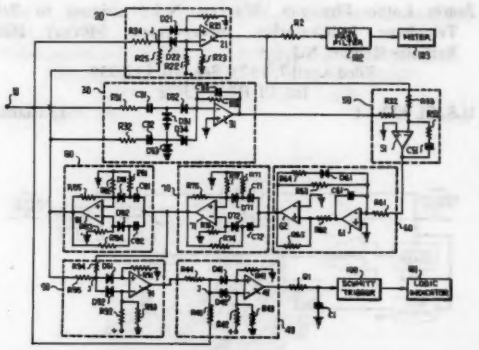


An improved VHF television antenna includes a pair of elongated antenna elements mounted on a base member and a noise matched amplifier connected directly to each element to amplify the received signal which is then transferred by a low impedance cable to a television set. The input impedance of each amplifier is noise matched to the impedance of its corresponding element at the center of the band of wavelengths for which the element is designed to receive.

3,703,686
PHASE LOCK LOOP AND FREQUENCY DISCRIMINATOR EMPLOYED THEREIN

Norris C. Hekimian, Rockville, Md., assignor to Hekimian Laboratories, Inc., Rockville, Md.

Filed Sept. 17, 1971, Ser. No. 181,434
Int. Cl. H03b *3/04*
U.S. Cl. 331—11 **10 Claims**



A phase lock loop employs a frequency discriminator having a relatively slow response to pull a voltage controlled oscillator into frequency lock with an input signal. After frequency lock the output of the frequency discriminator is nulled and a phase detector becomes effective to maintain phase lock. The frequency discriminator utilizes an operational amplifier to which both the input and oscillator signals are capacitively

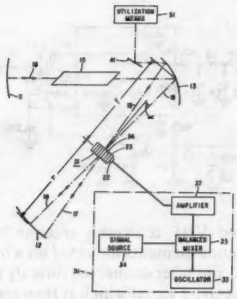
coupled through respective oppositely poled diode gates. A feedback capacitor, which is much larger than the input coupling capacitors, has charge transferred thereto fro m each coupling capacitors during alternate half cycles of the input and oscillator signals. The net charge across the feedback capacitor is a measure of the frequency difference between the input and oscillator signals, and is zero at frequency lock.

3,703,687

INTRACAVITY MODULATOR

Dan Maydan, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Feb. 12, 1971, Ser. No. 115,026
Int. Cl. H01s *3/05, 3/10*
U.S. Cl. 331—94.5 **13 Claims**



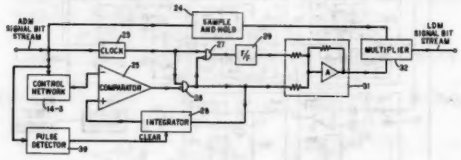
An intracavity modulator is disclosed in which a laser and an acousto-optic modulator are located in a cavity comprised of at least two high reflectivity mirrors. The geometry of the cavity is such that a beam of radiation from the laser has a waist in a region near the center of curvature of one of the mirrors. The acousto-optic modulator is located in this region. In a preferred embodiment of the invention, three mirrors are used to form a V-shaped cavity. The laser is located between two of these mirrors in one side of the V, and the acousto-optic modulator is located in the other side of the V.

3,703,688

DIGITAL ADAPTIVE-TO-LINEAR DELTA MODULATED SIGNAL CONVERTER

James Loton Flanagan, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed April 7, 1971, Ser. No. 132,059
Int. Cl. H03k *13/22*
U.S. Cl. 332—1 **13 Claims**



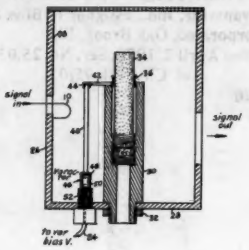
A digital adaptive delta modulated (ADM) to linear delta modulated (LDM) signal converter is disclosed which operates at a predetermined multiple, *m*, of the applied adaptive modulated signal bit rate, 1/T. At each pulse time of the ADM signal, the adaptive step size is determined in a conventional manner; the determined step size is then utilized to develop a signal which is a linear delta modulated representation of the applied ADM signal.

3,703,689

MICROWAVE VARACTOR-TUNED RESONATOR FOR PRESELECTOR

Jon R. McAtee, Rockville, Md., assignor to Microdyne Corporation

Filed Feb. 26, 1971, Ser. No. 119,178
Int. Cl. H01p *7/04*
U.S. Cl. 333—82 B **1 Claim**



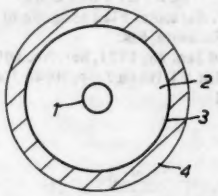
A tunable varactor resonator has a high-Q cavity and a concentric inner probe, with one end of the concentric probe connected electrically to an eccentric probe of higher characteristic impedance in series with a varactor. Minimum insertion loss, approximately constant unloaded Q, and usability of low-Q varactor diodes are features.

3,703,690

DIELECTRIC WAVEGUIDES

Ivor Albert Ravenscroft, Woodbridge, and Lynden Ashrooke Jackson, Ipswich, both of England, assignors to The Post Office, London, England

Filed Dec. 15, 1970, Ser. No. 98,242
Claims priority, application Great Britain, Dec. 17, 1969, 61,589/69
Int. Cl. H01p *3/16, 3/18*
U.S. Cl. 333—95 S **4 Claims**



A dielectric waveguide for millimetric wavelengths comprising a core of polymer material supported by a body of foamed polymeric material and enclosed in a protective jacket.

3,703,691

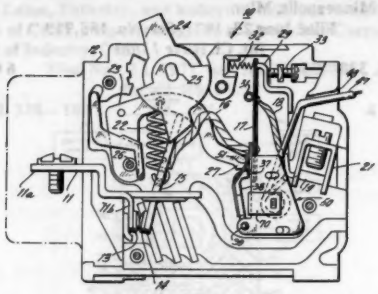
SHUNT TRIP WITH LOAD TERMINAL

Carl E. Gryctko, Haddon Heights, N.J., and Howard R. Shaffer, Glenside, Pa., assignors to I-T-E Imperial Corporation, Philadelphia, Pa.

Filed Aug. 31, 1971, Ser. No. 176,641
Int. Cl. H01h *83/10*
U.S. Cl. 335—20 **10 Claims**

A compact circuit breaker having automatic overload protection is provided with a shunt tripping coil that generates flux to release the same latch acted upon by the overload protection means. The shunt trip coil within the circuit breaker is

connected to a shunt lead, extending from the breaker, and to the conventional load terminal. Typically, external of the



breaker the shunt lead is connected to neutral through a normally open pushbutton switch and voltage is removed from the shunt trip coil when the breaker opens.

3,703,692

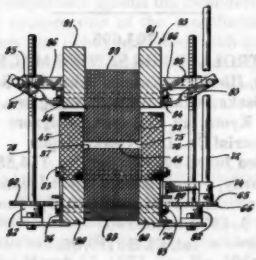
MECHANICALLY ADJUSTABLE HIGH VOLTAGE INDUCTIVE REACTOR FOR SERIES RESONANT TESTING

Stanley G. Peschel, Brewster, N.Y., assignor to Hipotronics, Inc., Brewster, N.Y.

Continuation of Ser. No. 871,205, Nov. 3, 1969, abandoned, which is a division of Ser. No. 730,711, May 11, 1968, Pat. No. 3,515,986. This application Nov. 3, 1971, Ser. No. 195,485

Int. Cl. H01f *21/06*

U.S. Cl. 336—134 **2 Claims**



Mechanically adjustable inductive reactor for series-resonant corona and dielectric testing of capacitive loads, such as, long lengths of high voltage electrical transmission cable which enable unusually long lengths of unusually high voltage cable to be tested conveniently and economically. The invention provides advantages when testing shorter lengths of cable at the usual voltage levels of 150,000 volts or 225,000 volts, but the advantages become greater at the higher voltages and longer lengths forseen in the future by the inventor. A mechanically adjustable high-voltage inductor is resonated directly in series with the cable capacitance of a long cable at high voltage. Three embodiments of mechanically adjustable, low flux-fringing, inductors are disclosed which are linear in inductance variation as a function of mechanical movement and are convenient and quiet to operate as well as being economical in amounts of steel and copper materials employed for a given electrical (kilovolt-ampere) rating.

3,703,693

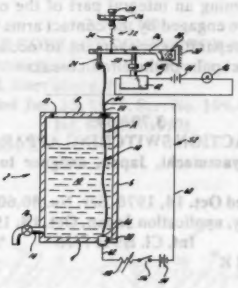
LIQUID LEVEL SENSING SYSTEM

Robert N. Levinn, Catskill, N.Y., assignor to American Thermostat Corporation, South Cairo, N.Y.

Filed April 1, 1971, Ser. No. 130,200

Int. Cl. F03g *7/06*; G08b *21/00*; H01h *61/01*

U.S. Cl. 337—1 **3 Claims**



For detecting a level of a liquid in a container, an element is mounted in a container so as to extend along an area corresponding to the location where liquid depth is to be detected. That element is formed of a material having a "memory" which is actuated when the material is subjected to a predetermined temperature, to cause the material to change its shape and therefore alter the effective length of the element. Heat is provided to the element, as by causing an electrical current to pass therethrough, in such an amount as to cause said element to be heated to said predetermined temperature when said element is enveloped by air or some other fluid of relatively low heat-dissipating characteristic, but the liquid of the level of which is to be sensed has a relatively high heat-dissipating characteristic such that the liquid-enveloped sections of the element will not be raised to said predetermined temperature. It is only when a given length of said element is exposed to air or other fluid, thus causing that length to exceed said predetermined temperature, that sufficient force is developed to actuate an appropriate work means such as a switch controlling an alarm system or the like.

3,703,694

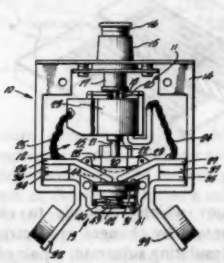
CONTACT OPERATING MECHANISM FOR CONTACT BREAKER

John W. Bullock, Northridge, Calif., assignor to Arrow-Hart, Inc., Hartford, Conn.

Continuation of Ser. No. 11,259, Feb. 13, 1970, abandoned. This application Oct. 29, 1971, Ser. No. 193,915

Int. Cl. H01h *71/16*, *73/06*, *73/30*

U.S. Cl. 337—62 **17 Claims**



A contact closure mechanism for a circuit breaker has a pair of contact arms bearing contacts which are pivotally mounted at their mid-sections on the ends of outwardly extending projections formed on a member slidable along an

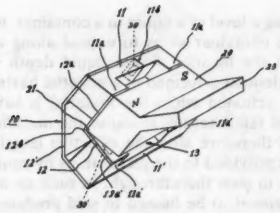
axis. A coiled contact pressure spring urges the contact arms into closure relationship with respective stationary contacts to establish electrical contact. A coiled contact opening spring coaxially disposed with respect to the pressure spring, selectively urges the slide member in one direction along the axis when the latching load pressure is relieved, causing the contact arms to pivot and their contacts to separate from the fixed contacts a distance which is exponential with respect to movement of said slide member. As the slide member moves, rocker cams forming an integral part of the opposing inside housing walls, are engaged by the contact arms which causes a rolling, pivotal separating movement to occur between the respective contact pairs of the circuit breaker.

3,703,695

SNAP-ACTION SWITCHING APPARATUS

Toshio Mogi, Ayasemachi, Japan, assignor to Denki Onkyo Co., Ltd.

Filed Oct. 14, 1970, Ser. No. 80,602
Claims priority, application Japan, Oct. 18, 1969, 44/99229
Int. Cl. H01c 7/16
U.S. Cl. 338—32 R **8 Claims**



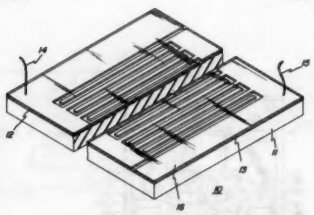
A snap-action switching apparatus comprised of two external yokes at opposite positions separated by a certain distance in which one center yoke is inserted, a closed magnetic path for which one of the said external yokes is selectively used by alternately attracting the center yoke onto said two external yokes, and at least one galvano-magnetro effect device which is provided on at least one of said three yokes so that the galvano-magnetro effect device functions when the central yoke and external yokes form a closed magnetic path.

3,703,696

HUMIDITY SENSOR

Kenneth W. Browall, Scotia, and Leonard V. Interrante, Schenectady, both of N.Y., assignors to General Electric Company

Filed Nov. 23, 1971, Ser. No. 201,279
Int. Cl. H01c 13/00
U.S. Cl. 338—35 **9 Claims**



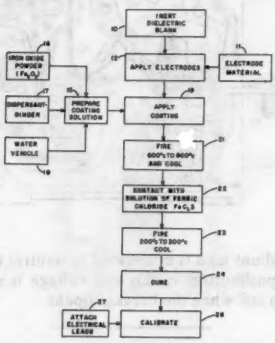
A humidity sensor which responds to changes in atmosphere water content by changes in electrical resistance, has an electrically insulating substrate, a pair of spaced apart interdigitated electrodes positioned on one surface of the substrate, an electrical lead in contact with each of the electrodes, and a thin film of chloromethylated quaternized polystyrene containing from 3.3 to 8.6 percent chlorine adhering to the electrode surface of the sensor.

3,703,697

RELATIVE HUMIDITY SENSOR

Merle E. Nicholas, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 23, 1971, Ser. No. 155,919
Int. Cl. H01c 13/00
U.S. Cl. 338—35 **6 Claims**



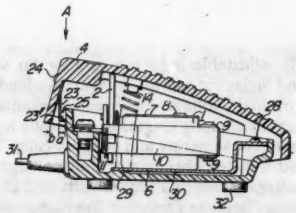
An essentially full range resistance type relative humidity sensing element is produced by providing a dielectric blank, on which an electrode system has been applied, with a metal oxide coating, in a manner which imparts a porous structure thereto, and subsequently chemically bonding chlorine covalently into the oxide to produce an oxychloride structure. The metal oxide used is selected from a group, including those of Group VIII, Period 4 of the Periodic Table, which exhibit electrical insulating properties, the amount of electrical resistance thereof being dependent on the relative humidity of the environment to which it is exposed. The sensing element thus produced exhibits a much lower total electrical resistance coupled with a narrower range of variation in resistance produced by changes in relative humidity whereby rendering it compatible with ordinary electrical resistance measuring devices.

3,703,698

CONTROLLER FOR SEWING MACHINE

Fumio Nomura, Hirakata; Yutaka Takamiya; Sakuhiro Mizuno, both of Osaka; Kunio Higashi, Neyagawa, and Toshihiro Shimamoto, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 18, 1971, Ser. No. 154,582
Claims priority, application Japan, June 26, 1970, 45/64022; June 26, 1970, 45/64023; June 26, 1970, 45/64024; July 3, 1970, 45/66896
Int. Cl. H01l 9/06
U.S. Cl. 338—108 **4 Claims**



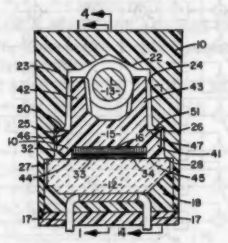
A controller for a sewing machine comprising an auxiliary pile-pressing plate which is attached at one end to supporting plates and engaged at the other end with a pull bar which is driven by a pedal, a pile-pressing plate kept in contact at one end with the supported end of said auxiliary pile-pressing plate and held at the other end engageably apart from said auxiliary pile-pressing plate, and a pile-pressing part kept in contact with said pile-pressing plate.

3,703,699

TRIMMER POTENTIOMETER HAVING MEANS FOR LEAD SCREW MISALIGNMENT COMPENSATION

James Lahm, Fullerton, and Robert D. Hill, Jr., West Covina, both of Calif., assignors to Spectrol Electronics Corporation, City of Industry, Calif.

Filed Nov. 12, 1971, Ser. No. 198,387
Int. Cl. H01c 9/02
U.S. Cl. 338—180 4 Claims



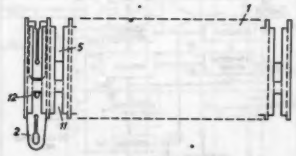
A trimmer potentiometer having a housing with an elongated interior cavity therein is provided with an axially extending lead screw which is subject to alignment tolerances during assembly. A substrate member having parallel resistor and collector elements on a flat surface thereof substantially closes an open side of the interior cavity of the housing. A pair of axially extending shoulders are defined by opposite side walls of the interior cavity which are spaced from and oppose a substantially flat surface on the substrate. A wiper member has a pair of flanges at opposite sides thereof disposed between the substrate member and the shoulders of the housing. The bottom surface of the wiper member is formed with a pair of spaced runners having a surface which slides along the substrate member. The other side of the flange on the substrate forms a shoulder overlying and opposing the shoulder on the housing member. A pair of spaced, resilient, conical protuberances are formed on both of the shoulders on the wiper member and engage and are compressed against the shoulders on the housing member. The compression of the protuberances forces the runner members into tight engagement with the substrate and prevents a misaligned lead screw from causing a wobbling or rocking motion to the wiper member during adjustment of the trimmer potentiometer.

3,703,700

TERMINAL BLOCK FOR SLOT CONNECTION OF INSULATED CONDUCTORS

Sune Sigurd Sixten Hasselbohm, Hagersten, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed March 17, 1971, Ser. No. 125,301
Claims priority, application Sweden, April 8, 1970, 4766/70; Dec. 1, 1970, 16230/70
Int. Cl. H01r 9/00
U.S. Cl. 393—198 R 4 Claims



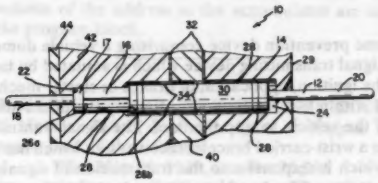
A terminal block for slot connection of insulated conductors, in particular for telecommunication lines, compresses a number of terminals fixed in a flat-shaped holder. Each terminal is bent 180° around a transverse line dividing the terminal into a longer and a shorter part, the longer part being inserted in a through passage of the holder and the shorter part in blind recess. The insulated conductor is connected to a terminal of the terminal block by pressing it into a pair of slots which are running parallelly from a hole in the bent end of the terminal towards the ends of each of the parts. In order to prevent the terminal from sliding in its recesses there is provided an embossed stop in the longer part which stop snaps against a bottom edge of a cut-out in the holder when the terminal has been inserted in the holder.

3,703,701

MOVABLE CONTACT CONNECTOR ASSEMBLY

John Aaron Zimmerman, Jr., Hershey, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 25, 1971, Ser. No. 109,491
Int. Cl. H01r 9/08
U.S. Cl. 339—221 R 2 Claims



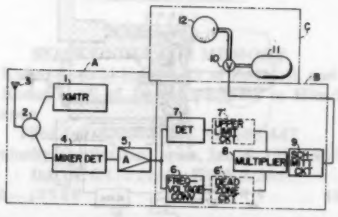
A contact pin having a collar is removably retained within a housing cavity by a retention bushing comprising a longitudinally split cylindrical sleeve encircling the connector terminal of the pin. The collar of the pin is held between a shoulder at the rear of the cavity and the rear end of the sleeve. The walls of the cavity radially compress the sleeve so as to retain the contact pin and the sleeve within the housing.

3,703,702

AIR BAG SAFETY DEVICE FOR VEHICLE PASSENGERS

Hiroshi Arai, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Japan

Filed May 7, 1971, Ser. No. 141,155
Claims priority, application Japan, Nov. 16, 1970, 45/100160
Int. Cl. B60r 21/06
U.S. Cl. 340—52 R 17 Claims



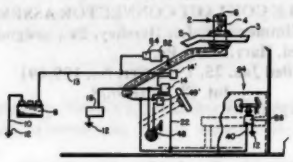
The disclosure concerns a safety device for a vehicle wherein a Doppler transmitter-receiver apparatus mounted on the vehicle and transmitting and receiving radiation from objects in the path of the vehicle forms a safety signal when the vehicle is about to crash into an object. The safety signal actuates a protective apparatus which blows up an air bag to restrain passengers in the vehicle. To test the safety device, a manual switch causes the transmitter-receiver apparatus to transmit radiation toward the vehicle's radiator fan as the latter moves toward the radiation. The switch directs the resulting safety signal to energize an indicator lamp that shows the system to be operational.

3,703,703

VEHICLE THEFT SIGNALLING DEVICE

Sumas Payne, 8522 South Maryland Avenue, Chicago, Ill.

Continuation of Ser. No. 48,982, Jan. 24, 1970, abandoned.
This application Jan. 3, 1972, Ser. No. 214,891
Int. Cl. B60r 25/10
U.S. Cl. 340—63 5 Claims



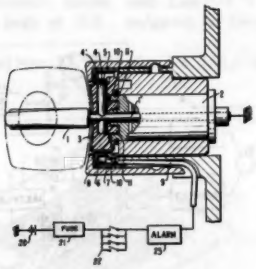
A crime prevention device comprising a vehicle dome light with a signal transmitting device which is actuated by tampering of the ignition, application of brakes or starter mechanism coupled with a locking system for locking the doors and windows of the vehicle to trap the thief. The signal transmitter is tuned to a wrist-carried bracelet receiver unit which has a light signal which is responsive to the transmission of signals from the transmitter. The bracelet unit is adapted to be manually actuated to light, for alerting the police force of impending criminal activity.

3,703,704

AUTOMOTIVE VEHICLE WARNING DEVICE WITH ALL POSITION IGNITION KEY CIRCUIT ACTUATION VIA STEERING LOCK

Gerhard Schiesterl, Stuttgart-Mohringen, and Josef Eibl, Ingolstadt/Danube, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Feb. 13, 1970, Ser. No. 11,167
Claims priority, application Germany, Feb. 14, 1969, P 19 07 390.6
Int. Cl. B60r 25/04; B60q 1/52; H01r 31/08
U.S. Cl. 340—64 9 Claims



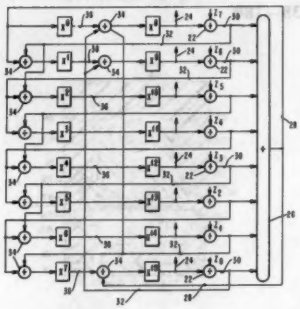
A steering lock for a motor vehicle which includes a make-contact to actuate a warning installation when the ignition key is left inserted in the lock and a vehicle door is opened; the locking cylinder of the steering lock includes a mounting support made from insulating material which contains two opposite pins or spring-ring parts projecting into the path of the key but without contacting one another; the inner ends of the pins or spring-ring parts may be constructed ball-shaped, conical, or the like, and are in contact with their outer ends at a slip-ring that is connected with the warning installation.

3,703,705

MULTI-CHANNEL SHIFT REGISTER

Arvind M. Patel, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,205
Int. Cl. G06f 11/12
U.S. Cl. 340—146.1 AL 7 Claims



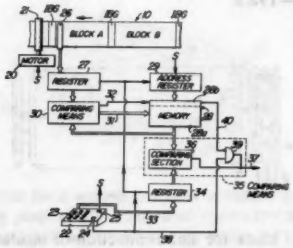
A linear feedback shift register for operating on a plurality f of parallel inputs according to a generator polynomial to produce encoding and decoding is provided having a plurality r of shift register stages $X_0 \ldots X_{r-1}$ each corresponding to one of the terms in the generator polynomial. A first plurality of modulo 2 addition means connect, for modulo 2 addition, each of said f data bit inputs $Z_{l+f-1}, Z_{l+f-2}, \ldots, Z_{l+1}, Z_l$ of the shift register to the output of an individual one of the last f register stages $X_{r-f}, X_{r-f+1}, \ldots, X_{r-1}$ according to the relationship Z_{l+f-1} to X_{r-f}, Z_{l+f-2} to $X_{r-f+1}, \ldots, Z_l$ to X_{r-1}. A second plurality of modulo 2 addition means are connected to the respective inputs of the first X_{r-f+2} shift register stages. The first feedback connection from the output of each of said first plurality of modulo 2 addition means in said f shift register stages is connected to each of two preceding second modulo 2 addition means in accordance with the relationship X_{r-f+1} to X_1 and X_3; X_{r-f+2} to X_2 and X_3; X_{r-1} to X_{r-f+1} and X_{r-f+2}. A third modulo 2 addition means connects each output of the first plurality of modulo 2 addition means to the register stages determined in accordance with the non-zero coefficients in the generator polynomial.

3,703,706

RECORD VERIFICATION APPARATUS

Mitsuo Ogura, and Satoshi Itoh, both of Odawara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 17, 1971, Ser. No. 116,200
Claims priority, application Japan, Feb. 20, 1970, 45/14187
Int. Cl. G06k 5/00
U.S. Cl. 340—146.1 BA 10 Claims



A record verification apparatus for comparing information of a block to be verified with verifying information so as to verify the former information. In the apparatus, information of the succeeding block is supplied to a first storage position of a

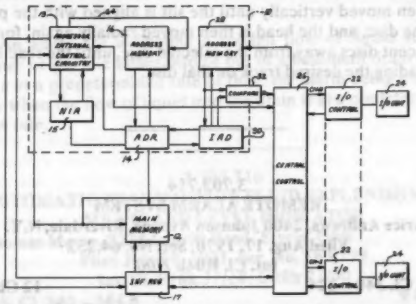
memory to be compared with information of the preceding block having been previously verified, and information indicative of coincidence or non-coincidence therebetween is stored in a second storage position of the memory. Verifying information is compared with the information to be verified stored in the first storage position of the memory or with the coincidence or non-coincidence information stored in the second storage position of the memory to carry out the verification of the information to be verified.

3,703,707

DUAL CLOCK MEMORY ACCESS CONTROL

Duane E. Bovett, Claremont, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed April 28, 1971, Ser. No. 138,254
Int. Cl. G06f *3/04, 9/18*
U.S. Cl. 340—172.5 7 Claims



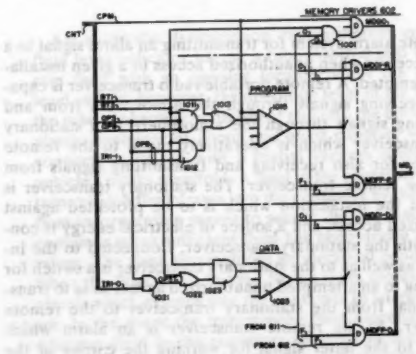
There is described a control for accessing the main memory of a digital computer from a processor or a number of input/output control units on a time-sharing basis where the processor operates at a clock rate twice the speed of the input/output control devices. A buffering arrangement is provided which permits overlapping of the servicing of the input/output devices and the servicing of the processor which permits the processor to access memory between each input/output device memory access while still permitting the input/output devices to be serviced on a continuous basis.

3,703,708

MEMORY EXPANSION ARRANGEMENT IN A CENTRAL PROCESSOR

James Harold Foster, Jasper, Ontario, Canada, assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 12, 1971, Ser. No. 142,649
Int. Cl. G11c *7/00*
U.S. Cl. 340—172.5 13 Claims



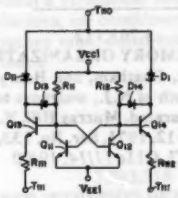
The memory is divided into a program block and a data block with identical addresses for the two blocks, and a "paging" technique is used to select the appropriate block. The computer has an operation cycle for the execution of each instruction, the cycle being divided into intervals designated bit times. The first bit time of each cycle is used to read a program instruction word, and for some of the instructions a given other bit time of the cycle is used to read the contents of the operand address of the instruction. The paging technique comprises always reading a word from the program block during the first bit time, and during the other given bit times, for those instructions requiring reading the contents of the operand address, selecting either the program block or the data block depending upon the operation code. This permits operand addresses designating literals to be in the program block, while the principal data base is placed in the data block. In particular a transfer instruction does not have an operand address, but is used to take an address from the accumulator and read the contents thereof from the data block. To permit a similar operation for words in the program block, for example during a memory dump, a fetch instruction produces operations identical to those of the transfer operation, except that the contents of the address in the accumulator are obtained from the program block.

3,703,709

HIGH SPEED ASSOCIATIVE MEMORY CIRCUITS

Shigeki Matsue, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed May 21, 1970, Ser. No. 39,291
Claims priority, application Japan, May 24, 1969, 44/40505; Jan. 28, 1970, 45/7435
Int. Cl. G11b *13/00*
U.S. Cl. 340—173 FF 4 Claims



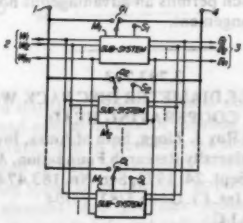
A high-speed associative memory circuit is disclosed comprising a flip-flop operating as a memory storage circuit, and a pair of switching transistors connected to the "true" and "not" output terminals of the flip-flop. The latter transistor pair thus defines a circuit for detecting the state of the flip-flop transistors.

3,703,710

SEMICONDUCTOR MEMORY

Masaharu Kubo; Ryoichi Hori, both of Hachioji, and Minoru Nagata, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 4, 1971, Ser. No. 103,447
Claims priority, application Japan, Jan. 5, 1970, 45/1811
Int. Cl. G11c *11/40*; H03k *3/286*
U.S. Cl. 340—173 FF 11 Claims



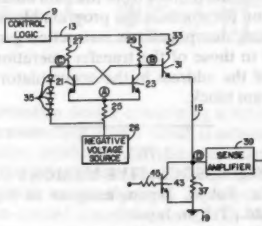
A semiconductor memory comprising semiconductor elements organized into a plurality of sub-systems individually

provided with respective power supply switches each actuated in synchronism with or in response to the select signal to the corresponding sub-system, whereby a predetermined amount of power is supplied only to the selected sub-system while the remaining sub-systems receive no power or just sufficient power to maintain their memory content.

3,703,711
MEMORY CELL WITH VOLTAGE LIMITING AT TRANSISTOR CONTROL TERMINALS

Franklin T. Duben, Dedham, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 4, 1971, Ser. No. 103,483
Int. Cl. G11c *7/00, 11/40;* **H03k** *3/286*
U.S. Cl. 340—173 FF **7 Claims**

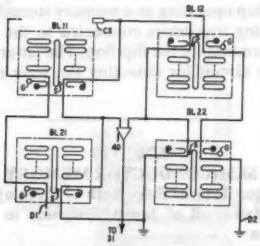


A memory cell comprising cross coupled switch elements with internal limiting means for establishing a switching condition requires only two signal lines to both select a cell from an array and perform reading and writing operations.

3,703,712
MASS MEMORY ORGANIZATION

Andrew Henry Bobeck, Chatham, and Henry Evelyn Derrick Scovil, Gladstone, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed April 12, 1971, Ser. No. 133,206
Int. Cl. G11c *11/14, 19/00*
U.S. Cl. 340—174 TF **17 Claims**



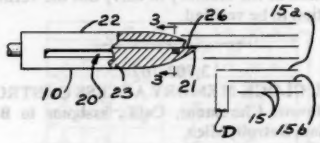
Layers of materials in which single wall domains can be moved and operated in the familiar field access mode are organized in an array and operated in a word-organized block access fashion which permits an advantageous noise cancellation detection arrangement.

3,703,713
VARIABLE DIAMETER DISC PACK WITH COOPERATING HEAD

Arthur Pohm, and Roy J. Zingg, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Ames, Iowa

Filed Sept. 24, 1971, Ser. No. 183,474
Int. Cl. G11b *5/82, 25/04*
U.S. Cl. 340—174.1 C **7 Claims**

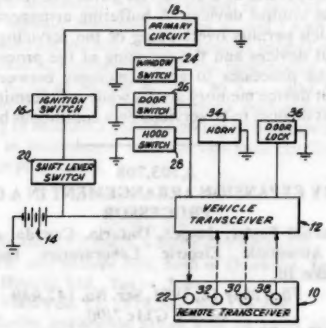
A large electronic memory system, designed to store up to 10^{12} bits, includes a large number of flexible discs coated with a magnetizable material for recording. The discs are arranged in groups, and each group includes a number of discs of increasing diameter. A thin read head is formed with a central slit that is designed to receive a disc selected to be read. The head is moved radially until its tapered distal end aligns vertically with the outer diameter of a disc desired to be selected. It is then moved vertically until the slit is aligned with the plane of the disc, and the head is then moved radially again, forcing adjacent discs away from the selected disc, until the read head is reading the desired track on that disc.



3,703,714
REMOTE ALARM SYSTEM

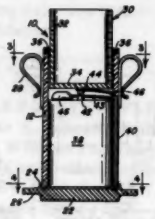
Maurice Andrews, 2400 Johnson Avenue, Riverdale, N.Y.

Filed Aug. 17, 1970, Ser. No. 64,232
Int. Cl. H04b *7/00*
U.S. Cl. 340—224 **12 Claims**



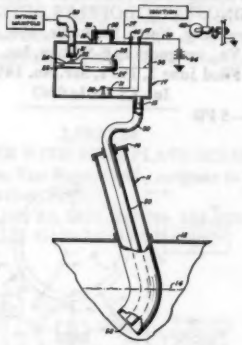
A remote alarm system for transmitting an alarm signal to a remote receiver when unauthorized access to a given installation is attempted. A remote portable radio transceiver is capable of receiving signals through the atmosphere from and transmitting signals through the atmosphere to a stationary radio transceiver which is operatively tuned to the remote transceiver for also receiving and transmitting signals from and to the remote transceiver. The stationary transceiver is located at the installation which is to be protected against unauthorized access, and a source of electrical energy is connected with the stationary transceiver. Connected to the installation as well as to the stationary transceiver is a switch for responding to an attempted unauthorized access so as to transmit a signal from the stationary transceiver to the remote transceiver. At the remote transceiver is an alarm which responds to the latter signal for warning the carrier of the remote transceiver that an attempted unauthorized access is being made at the installation.

3,703,715
FLOOD ALARM
Byron L. McNally, 1526 Scott Street, Chicago Heights, Ill.
Filed Dec. 21, 1970, Ser. No. 100,177
Int. Cl. G08b 21/00
U.S. Cl. 340—240 5 Claims



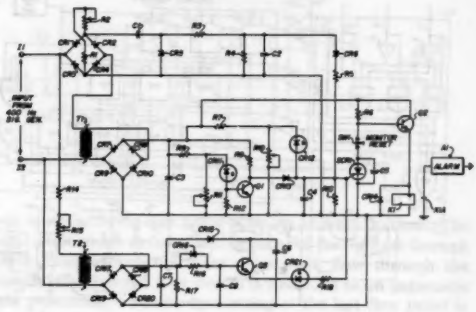
An alarm for indicating a sudden flow of liquid such as water or the like either into or out of a basement drain or the like at a predetermined rate of flow, the alarm being inoperable when the flow of liquid into the drain is at a predetermined low rate.

3,703,716
AUTOMATIC TRANSMISSION FLUID REPLENISHMENT MEANS AND LEVEL INDICATOR
Thomas Moore, 7235 Leavitt Road, Elyria, Ohio
Filed July 19, 1971, Ser. No. 163,799
Int. Cl. F16k 31/18; G08b 21/00
U.S. Cl. 340—244 B 9 Claims



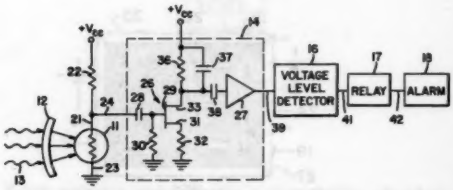
An automatic transmission replenishment container and fluid level indicator having a tube inserted into the transmission fluid with an opening located below the normal fluid level, within, however, the operating level of the transmission, the tube connecting on its upper end into the bottom of a clear plastic container of about one quart capacity which further connects at its top with a partial vacuum source such as a vehicle's intake manifold. A float in the container is buoyed by transmission fluid drawn into the container by the vacuum, the float incorporating means to secure the vacuum line into the container when sufficient fluid has been drawn into the container. The float also includes an electrical conductor which, when the float is not buoyed by the fluid, closes an electrical circuit which extends into the container to energize an indicator. In the event the transmission fluid descends to the tube opening, fluid in the container received in the transmission maintains the transmission fluid at an operating level until at least the container fluid has been entirely emptied from the container.

3,703,717
VOLTAGE/FREQUENCY RATIO MONITOR FOR A. C. SIGNALS
Karl H. Kuster, Glendale Heights, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Jan. 11, 1971, Ser. No. 105,174
Int. Cl. G08b 21/00
U.S. Cl. 340—253 Y 8 Claims



A circuit for use with a signal generator to monitor the output signals, that provides an alarm indication if either voltage or frequency fall below or exceed predetermined limitations. Only signals within a permissible voltage/frequency ratio, regardless of limitations, are considered acceptable. Monitoring of voltage/frequency ratio, signal symmetry, and voltage amplitude are included.

3,703,718
INFRARED INTRUSION DETECTOR SYSTEM
Herbert L. Berman, Los Altos Hills, Calif., assignor to Optical Coating Laboratory, Santa Rosa, Calif.
Continuation-in-part of Ser. No. 9,315, Feb. 6, 1970, abandoned. This application Jan. 7, 1971, Ser. No. 104,667
Int. Cl. H01j 39/00
U.S. Cl. 340—258 D 11 Claims



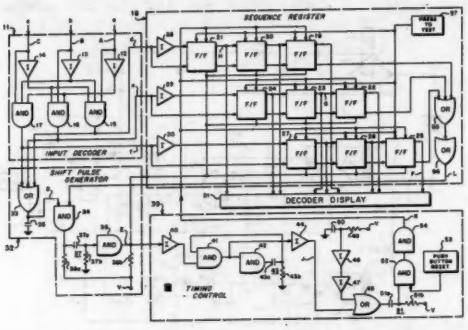
Infrared intrusion detector system utilizing a single sensing element and optical means for focusing radiation from one or more discrete fields of view onto the sensing element. An amplifier tuned to have a frequency response corresponding to the walking speed of an intruder amplifies the signal from the sensing element and provides means for discriminating between changes in infrared radiation due to the presence of an intruder and gradual temperature changes such as room or ambient changes.

3,703,719

SEQUENCE MATRIX

Henry R. Beyer, Chalfont; Thomas F. Long, Warminster, and Richard G. DeSipio, Philadelphia, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy

Filed May 31, 1967, Ser. No. 644,439
Int. Cl. H03k 13/243
U.S. Cl. 340—347 DD 6 Claims



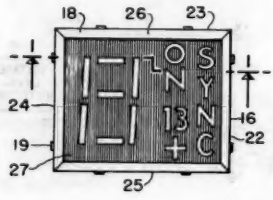
A sequence matrix for decoding *n* binary events each having *m* different states without the need for a clock or a data message preamble. Sequential binary input signals are applied to an input decoder which provides steering signals to a sequence register for storing the sequential information to provide a parallel pure binary word readout. The steering signals are shifted from one storage element in the shift register to another by shift pulses generated from the sequential input signals. A timing circuit triggered by the shift pulses initiates a time gate during which the sequential input signals must be processed or the register will be reset without providing a readout. The decoder readout from the sequence register is displayed on a decoder display.

3,703,720

LIGHTED DISPLAY BOX HAVING MEANS FOR ENCASING LAMP STRUCTURE

Joseph M. Cartelli, 63-10 110th Street, Forest Hills, N.Y.

Continuation of Ser. No. 7,820, Feb. 2, 1970, abandoned. This application Jan. 10, 1972, Ser. No. 216,850
Int. Cl. G08b 5/00
U.S. Cl. 340—381 R 1 Claim



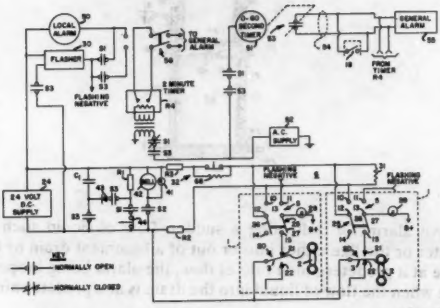
Lighted readout displays are assembled in a wide variety of forms from a selection of open ended boxes that are contained in a bezel cut and assembled from a uniform strip. The strip secures an indicating window in front of the boxes and securing a bulb carrying bus plate and a spring contact containing insulated back plate behind the boxes, the strip having a front flange extending in front of the window, containing integrally formed rearward extending assembly hooks securing the back plate in the bezel, and containing a stop ridge on which said back plate is seated within the bezel.

3,703,721

FIRE ALARM SYSTEM

Harry C. Goodwater, San Francisco, Calif., assignor to Audio Alert Corporation, San Francisco, Calif.

Filed June 1, 1971, Ser. No. 148,409
Int. Cl. G08b 1/00, 29/00
U.S. Cl. 340—409 4 Claims



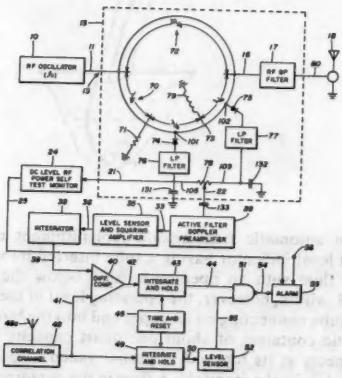
An alarm system is provided for use in conjunction with a conventional telephone or intercommunications system in which each telephone comprises a cradle circuit activated upon removal of a handset from its associated cradle. For indicating an alarm, there is provided in each telephone a self-locking alarm switch which is activated by a push-button made accessible only upon removal of the handset from the cradle.

3,703,722

MOTION DETECTION SYSTEM WITH SPLIT-RING MONOSTATIC DOPPLER DETECTION

David N. Gershberg, North Rockville, Md., and Alex Y. Lee, Arlington, Va., assignors to E-System, Inc., Dallas, Tex.

Filed June 2, 1971, Ser. No. 149,151
Int. Cl. G01s 9/42
U.S. Cl. 343—5 PD 16 Claims



A motion detection system wherein an RF transmitter is connected through a split-ring doppler detector to a transmit/receive antenna. Both the RF transmitter and the antenna are connected to nodes on the split-ring detector to provide a matched and balanced system. Diode detectors are connected, in opposite directions, to the ring detector at points between the transmitter load and the antenna to insure desired transmitter injection to the diodes for sensitive receiver operation. The diode detectors connect through individual low-pass filters to the inputs of an AC coupled, active filter, amplifier,

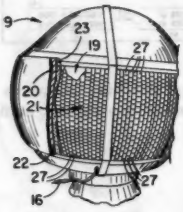
which amplifies the doppler return signal that has been conducted by the diode detectors, while rejecting unwanted doppler frequencies to reduce false alarms. A microwave bandpass filter is so positioned in the antenna line to further reduce false alarms by defining a specific radio frequency bandwidth. A self-test feature is provided in that the DC level at one or both detector diodes can be monitored. To further reduce false alarms a correlating detection system provides a back-up signal for the doppler detector.

3,703,723

PORTABLE PASSIVE REFLECTOR

Victor Albanese; Arthur E. Johnson, both of Valley Stream, and Charles L. Dietz, Williston Park, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, L.I., N.Y.

Filed Jan. 9, 1970, Ser. No. 1,610
Int. Cl. H01q 15/08
U.S. Cl. 343—18 D **4 Claims**



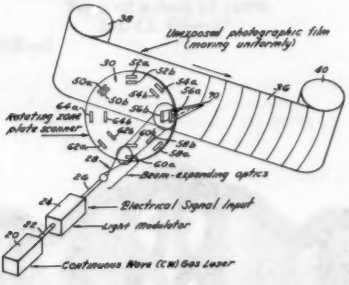
A portable passive reflector that utilizes a Luneberg lens to focus upon a diode array positioned about the focal region of the lens, an interrogating signal eminating from a predetermined direction. A reflecting plate is mounted behind the diode array a distance equivalent to multiples of a quarter wavelength of the interrogating signal. By selectively pulsing the diode array, the effective cross section of the reflector as seen by the interrogating radar is varied thus modulating the reflected signal.

3,703,724

RECORDER WITH ZONE PLATE SCANNER

Carlton E. Thomas, Van Nuys, Calif., assignor to KMS Industries, Inc., Ann Arbor, Mich.

Filed July 22, 1971, Ser. No. 165,020
Int. Cl. G11b 7/00; G02b 27/38
U.S. Cl. 346—108 **5 Claims**



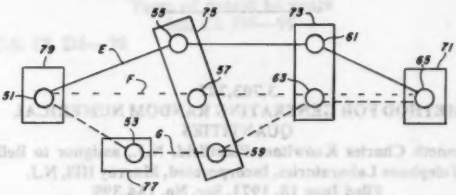
A zone plate scanner for wide bandwidth laser recorders utilizing a rotating disc having pairs of peripheral windows, each containing a zone plate, one set of windows in each pair being spaced circumferentially at a constant radius, and a second set being similarly spaced circumferentially but each having a different radius. The spacing changes the grating frequency for each pair and encodes each track on a moving film in a manner which eliminates interference in close spacing and reduces the criticality of readout equipment.

3,703,725

METHOD FOR OPERATING A MANUFACTURING LINE

Earl Raymond Gomersall, Chicago, Ill.; Roger Paul Meyer, Richardson, Tex., and Susan English Rejmaniak, Hackensack, N.J., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 2, 1970, Ser. No. 86,204
Int. Cl. G06f 15/20
U.S. Cl. 444—1 **19 Claims**



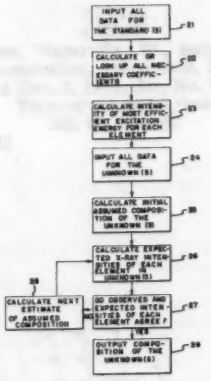
A manufacturing line has a plurality of work stations. The work stations are ordered into sequential flow points through which work in process flows. The work flow through the sequentially ordered flow points is balanced in an automatic data processing machine by starting at the last flow point in the ordered sequence. In a multiproduct path manufacturing line, the flow points on adjacent product paths are ordered into neighborhoods prior to balancing the manufacturing line.

3,703,726

QUANTITATIVE CHEMICAL ANALYSIS BY X-RAY EMISSION SPECTROSCOPY

Donald A. Stephenson, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Dec. 31, 1970, Ser. No. 103,193
Int. Cl. G06f 15/46
U.S. Cl. 444—1 **3 Claims**


INPUT ALL DATA FOR THE STANDARD (S)
31
CALCULATE OR LOOK UP ALL MEC ENGARY COEFFIC-IENTS
32
CALCULATE INTENSITY OF MOST EFFICIENT EXCITATION ENERGY FOR EACH ELEMENT
33
INPUT ALL DATA FOR THE UNKNOWN (S)
34
CALCULATE INITIAL ASSUMED COMPOSITION OF THE UNKNOWN (S)
35
CALCULATE EXPECTED X-RAY INTENSITIES OF EACH ELEMENT IN UNKNOWN (S)
36
CALCULATE NEXT ESTIMATE OF ASSUMED COMPOSITION
38
DO OBSERVED AND EXPECTED INTENSITIES OF EACH ELEMENT AGREE ?
37
YES
OUTPUT COMPOSITION OF THE UNKNOWN (S)
39

In X-ray emission spectrometry a quantitative chemical analysis of the elements in an unknown sample is obtained. A standard, or standards, whose composition has previously been accurately established is used to determine the first order approximation to the original intensity of the most efficient excitation energy for each element being determined. The most efficient excitation energy is defined as that energy which is just greater than the energy of the absorption edge of the characteristic X-ray emission line employed in the analysis. Using the computed original intensity of the most efficient excitation energy for each element in the standard(s), the observed X-ray intensities measured on the unknown, and an assumed chemical composition of the unknown, the expected

characteristic X-ray intensity for each element in the unknown is computed. The assumed chemical composition of the unknown is then adjusted by a self-consistent iterative procedure until the expected and observed X-ray intensities for each element being determined agree. In this manner the best estimate of the chemical composition of the unknown is determined.

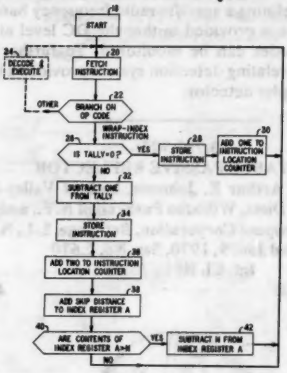
3,703,727

METHOD FOR GENERATING RANDOM NUMERICAL QUANTITIES

Kenneth Charles Knowlton, Plainfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 18, 1971, Ser. No. 154,399
Int. Cl. G06f 7/22
U.S. Cl. 444—1 24 Claims

In a digital computer, random numbers exhibiting any desired numerical distribution are generated by accessing a table of stored random numbers having the desired distribution starting at a predetermined location and indexing in wrap-around fashion using a predetermined random skip distance.



New starting points and skip distances are periodically generated using a conventional random number generator.

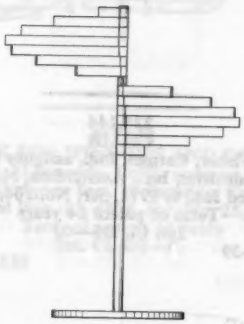
DESIGNS

NOVEMBER 21, 1972

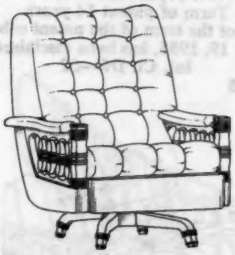
225,139
GLOVE
Raymond M. Vennettilli, 62 Rue Auguste Delaune, Villejuif, France
Filed Dec. 4, 1970, Ser. No. 26,285
Claims priority, application France Oct. 19, 1970
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—372

225,140
HEADBOARD FOR A BEDSTEAD OR SIMILAR ARTICLE
Huey T. Keller, 1609 Davidson Road, High Point, N.C. 27262
Filed Aug. 10, 1970, Ser. No. 24,384
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D5—4

225,141
MAGAZINE TREE
Hugh C. Acton, Ross Township, Kalamazoo County, Mich., assignor to The Vecta Group, Inc., Kalamazoo, Mich.
Filed Oct. 30, 1970, Ser. No. 25,735
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—20

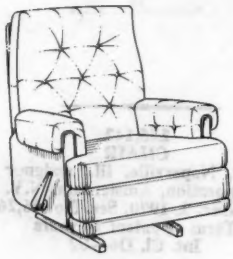


225,142
CHAIR
Thomas Winrow, Naperville, Ill., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed Dec. 3, 1970, Ser. No. 26,266
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—31

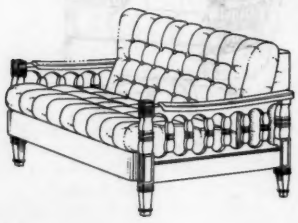


225,143
COMBINED VALET STAND AND SEAT
George J. Ritter, 32740 Whispering Palms Trail, Palm Springs, Calif. 92262
Filed Feb. 4, 1971, Ser. No. 112,846
Term of patent 14 years
Int. Cl. D6—02
U.S. Cl. D6—33

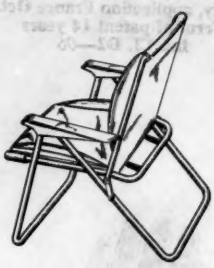
225,144
CHAIR
Morris F. Fisher, Carmel, Ind., assignor to Mohasco Industries, Inc., Amsterdam, N.Y.
Filed Jan. 6, 1971, Ser. No. 104,535
Term of patent 14 years
Int. Cl. D6—02
U.S. Cl. D6—39



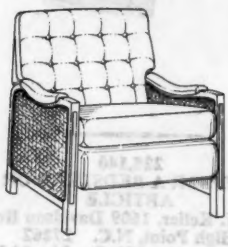
225,145
LOVESEAT
Thomas Winrow, Naperville, Ill., assignor to Futorian Corporation, Amsterdam, N.Y.
Filed Nov. 30, 1970, Ser. No. 26,207
Term of patent 14 years
The portion of the term of the patent subsequent to July 19, 1985, has been disclaimed
Int. Cl. D6—02
U.S. Cl. D6—63



225,146
ARMCHAIR
Heinz Kettler, Parsit, via Werl, Germany, assignor to Heinz Kettler, Parsit, via Werl, Germany
Filed Dec. 8, 1970, Ser. No. 26,346
Claims priority, application Germany June 18, 1970
Term of patent 14 years
Int. Cl. D6—02
U.S. Cl. D6—69



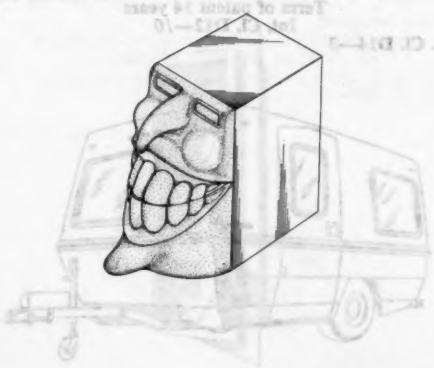
225,147
CHAIR
Morris F. Fisher, Carmel, Ind., assignor to Mohasco Industries, Inc., Amsterdam, N.Y.
Filed Jan. 4, 1971, Ser. No. 103,942
Term of patent 14 years
Int. Cl. D6—02
U.S. Cl. D6—71



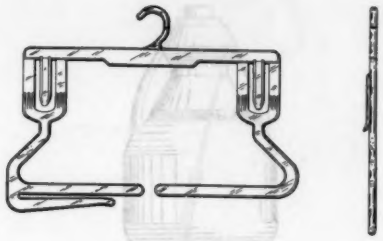
225,148
CHAIR
Morris F. Fisher, Carmel, Ind., assignor to Mohasco Industries, Inc., Amsterdam, N.Y.
Filed Jan. 6, 1971, Ser. No. 104,537
Term of patent 14 years
Int. Cl. D6—02
U.S. Cl. D6—71

225,149
COMBINED BEVERAGE CART AND HOUSING FOR AN AUDIO UNIT
Claudio Palumbo, Milan, Italy, assignor to Phono-Sonic Radio Corp., Brooklyn, N.Y.
Filed Oct. 15, 1970, Ser. No. 25,516
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—46

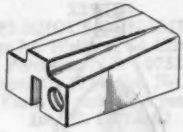
225,150
CHEST OF DRAWERS OR SIMILAR ARTICLE
Joseph H. Forrester, 9903 Melgar Drive, Whittier, Calif. 90601
Filed June 22, 1970, Ser. No. 23,579
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—152



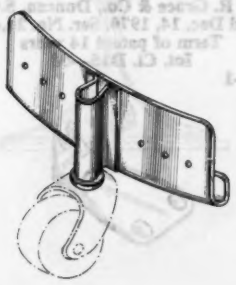
225,151
GARMENT HANGER
Robert L. Hart, Manhasset Hills, N.Y., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Mar. 4, 1971, Ser. No. 121,222
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—255



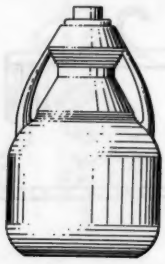
225,152
LOCK FOR WINDOWS AND DOORS
Ruth Robins, El Segundo, Calif., assignor to Packaging Techniques, Inc., El Segundo, Calif.
Filed Nov. 23, 1970, Ser. No. 26,121
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—150



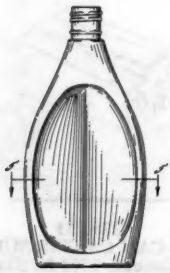
225,153
TRASH CAN CASTER SUPPORT
Jimmy J. Richmond, 1801 N. Kingsley Drive, Hollywood, Calif. 90027
Filed Apr. 22, 1970, Ser. No. 22,556
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—226



225,154
BOTTLE OR SIMILAR ARTICLE
Monroe J. Singer, 3160 NW. 80th Terrace, Miami, Fla. 33147
Filed July 6, 1971, Ser. No. 160,272
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—48



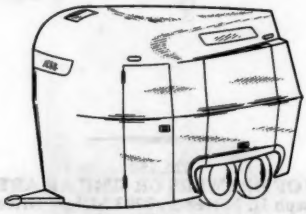
225,155
BOTTLE
Harold Schafer, Bismarck, N. Dak., assignor to Gold Seal Company, Bismarck, N. Dak.
Filed Mar. 23, 1971, Ser. No. 127,441
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—143



225,156
POSITIONER FOR POULTRY PRODUCTS AND THE LIKE
Philip L. Reid, Lyman, S.C., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Dec. 14, 1970, Ser. No. 26,462
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D11—1

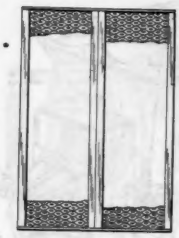
225,157
POSITIONER FOR POULTRY PRODUCTS AND THE LIKE
Philip L. Reid, Lyman, S.C., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Dec. 14, 1970, Ser. No. 26,463
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D11—1

225,158
STOCK TRAILER
Clinton W. Cole, Stephens, Okla. (Rte. 1, P.O. Box 92 S, Duncan, Okla. 73533)
Filed Feb. 25, 1971, Ser. No. 119,082
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D14—3

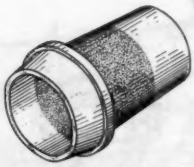


225,159
TRAILER
Stewart E. Gardner and Ronald J. Bibeau, Bristol, and Charles B. Bonifield, Fort Wayne, Ind., assignors to Gardner, Inc., Bristol, Ind.
Filed May 28, 1971, Ser. No. 148,282
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D14—3

225,160
FOOT PLATFORM FOR TRUCKS
Earl F. Thomas, 2412 Logan St.,
Des Moines, Iowa 50317
Filed Feb. 19, 1970, Ser. No. 21,509
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D14—6



225,161
COAGULYZER REACTION CUVETTE
David Alan Ritchie, St. Louis, Mo., assignor to Sherwood
Medical Industries Inc., St. Louis, Mo.
Filed Jan. 20, 1971, Ser. No. 108,257
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D16—1

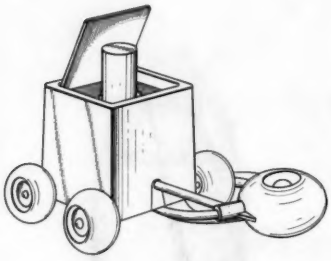


225,162
FIRE EXTINGUISHER CABINET
John Blendl, Warren, Mich., assignor to Metal Cabinet
Company, Warren, Mich.
Filed May 6, 1971, Ser. No. 141,095
Term of patent 14 years
Int. Cl. D29—*01*
U.S. Cl. D16—2

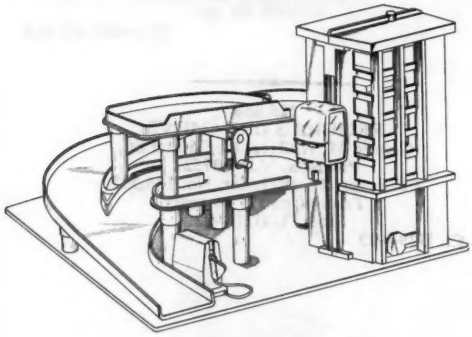
225,163
ELECTRIC LAMP
Theodore Waddell, Via Rio Torto, Fiesole, Florence, Italy
Filed July 13, 1970, Ser. No. 23,927
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D26—8

225,164
RELIGIOUS ORNAMENT
George M. Wallace, 64 Clinton St.,
Paterson, N.J. 07522
Filed Apr. 21, 1971, Ser. No. 136,301
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23

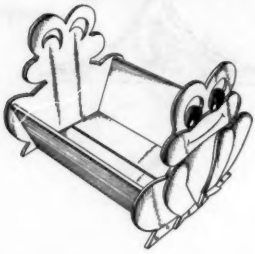
225,165
PULL TOY
Walter P. Doe, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 22, 1971, Ser. No. 117,847
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



225,166
TOY GARAGE
Duane E. Spengler and George O. Bartoo, West Falls, and John D. Smith, East Aurora, N.Y., assignors to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 22, 1971, Ser. No. 117,848
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



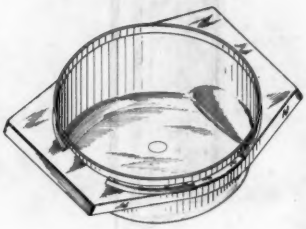
225,167
TOY BOX
Keith W. Billotte, 9116 Edmonston Court, Greenbelt, Md. 20770
Filed May 14, 1971, Ser. No. 143,719
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15



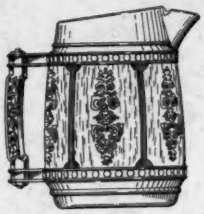
225,168
TOY VEHICLE
Allan Yeoh, Hong Kong, assignor to Louis Marx & Co., Inc.
Filed Sept. 1, 1971, Ser. No. 177,213
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

225,169
FONDUE HEATING STAND
John Terrence McGowan, Edina, Minn., assignor to International Multifoods Corp., Minneapolis, Minn.
Filed June 15, 1971, Ser. No. 153,484
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—10

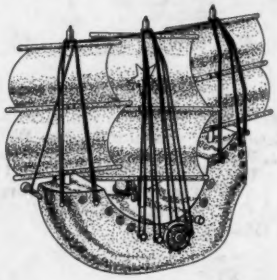
225,170
BOWL
Harold P. Ashton, Providence, and James B. Swett, Barrington, R.I., assignors to Dart Industries Inc., Los Angeles, Calif.
Filed Dec. 30, 1970, Ser. No. 26,706
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15



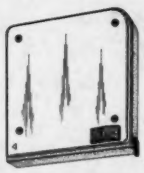
225,171
WATER PITCHER
Sidney Z. Smith, Worcester, Mass., assignor to The General Tire & Rubber Company
Filed Aug. 31, 1971, Ser. No. 176,798
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—21



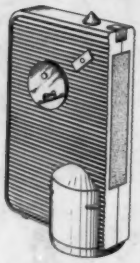
225,172
TELEVISION LAMP
Byon E. Eib, Solano County, Calif. (1825 Sonoma Blvd., Apt. 110, Vallejo, Calif. 94590)
Filed Sept. 23, 1971, Ser. No. 183,301
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20



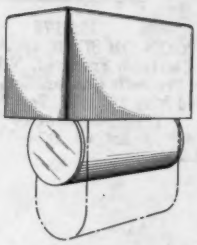
225,173
TAPE MEASURE
André Quenot, Besancon, France, assignor to Manufacture Quenot Mabo, Besancon, France
Filed Jan. 8, 1971, Ser. No. 105,141
Claims priority, application France Oct. 9, 1970
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D52—1



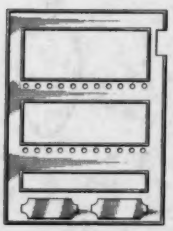
225,174
PLUMBLINE
André Quenot, Besancon, France, assignor to Manufacture Quenot Mabo, Besancon, France
Filed Jan. 8, 1971, Ser. No. 105,142
Claims priority, application France Oct. 9, 1970
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D52—1



225,175
TOWEL CABINET
Antonio M. Cassia, Milan, Italy, assignor to Steiner Company Lausanne S.A., Lausanne, Switzerland
Filed June 7, 1971, Ser. No. 150,893
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D52—2



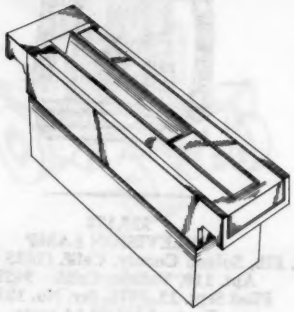
225,176
FRONT PANEL FOR A VENDING MACHINE
David S. Zipp, Los Angeles, Calif. (14649 Arminta St., Van Nuys, Calif. 91402)
Filed Oct. 26, 1970, Ser. No. 25,664
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D52—3



225,177
ARTICLE OF FLATWARE
Clayton A. Laughlin, Minneapolis, Minn., assignor to Arthur Salm Inc., Chicago, Ill.
Filed May 12, 1969, Ser. No. 17,123
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

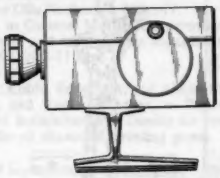
225,178
SPOON OR SIMILAR ARTICLE
Raymond T. Cleeland, Freehold, N.J., assignor to American Home Products Corporation, New York, N.Y.
Filed May 20, 1971, Ser. No. 116,692
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

225,179
PAPER SHREDDER
William Macowski, Caldwell, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed May 14, 1971, Ser. No. 143,743
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D55—1

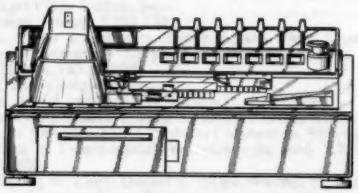


225,180
PORTABLE PIANO
George H. Weber, Seattle, Wash., and Robert Collins, Los Angeles, Calif., assignors to The Weber Corporation, Seattle, Wash.
Filed Feb. 26, 1971, Ser. No. 119,450
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—9

225,181
MOTION PICTURE VIEWER
James R. Skinner, Cupertino, Mark O. Ultz, Mountain View, and Paul W. Hait, Saratoga, Calif., assignors to F.J.L. Corporation, Mountain View, Calif.
Filed Oct. 5, 1970, Ser. No. 25,323
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D61—1



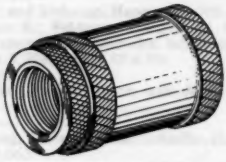
225,182
PRINTING MACHINE
Yasuaki Yamamoto, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan
Filed June 17, 1971, Ser. No. 153,961
Claims priority, application Japan Feb. 15, 1971
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11



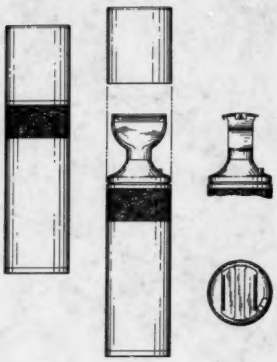
225,183
BUOYANT INFANT SEAT
Margaret J. Waters, 809 Rural Ave., R.R. 1, Decorah, Iowa 52101
Filed Feb. 8, 1971, Ser. No. 113,778
Term of patent 7 years
Int. Cl. D21—*03*
U.S. Cl. D71—1

225,184
COMBUSTION ENGINE MUFFLER
Donald H. Spies, 919 Amherst Lane, Wilmette, Ill. 60091
Filed Dec. 17, 1970, Ser. No. 26,553
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D77—1

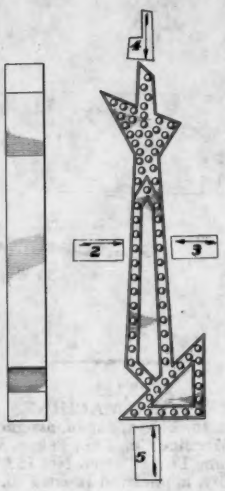
225,185
CLEANING ADAPTER FOR A JET HYPODERMIC INJECTION DEVICE
Benjamin Kittner, Fair Lawn, N.J., assignor to Vernitron Medical Products Inc., Carlstadt, N.J.
Filed June 1, 1971, Ser. No. 149,102
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—12



225,186
ELECTRIC RAZOR
Taisuke Ono and Shima Ito, Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Feb. 24, 1971, Ser. No. 118,583
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3



225,187
OUTDOOR ILLUMINATED SIGN
Conrad J. Escalante, 852 E. Ocean Ave., Long Beach, Calif. 90802
Filed Sept. 23, 1970, Ser. No. 25,151
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 21ST DAY OF NOVEMBER, 1972

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Abendroth, Paul; and Kaiser, Werner, to Roland Offselmaschinenfabrik Faber and Schleicher AG. Device for sensing and controlling the delivery pile of sheet-fed printing press. 3,703,283, Cl. 271-88.000.

Abrahams, Joseph L., to Rock Fall Company Limited. Method of rock drilling and apparatus for use therein. 3,703,212, Cl. 175-173.000.

Ackermann, Walter Thomas; and Daley, Thomas Joseph, to Scovill Manufacturing Company. Guide for sewing invisible fasteners. 3,703,148, Cl. 112-150.000.

Acron Corporation: *See—*
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Adkin, William C. Batting practice device. 3,703,286, Cl. 273-26.00e.

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Agnone, John L.; Fister, Robert V.; and Sheppard, Jon C., to Eastman Kodak Company. D. C. sputtering of particulate polymeric compounds onto a substrate. 3,703,585, Cl. 204-192.000.

Aichilithic Company, The: *See—*
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Albanese, Victor J.; Johnson, Arthur E.; and Dietz, Charles L., to Grumman Aerospace Corporation. Portable passive reflector. 3,703,723, Cl. 343-18.00d.

Alberto-Culver Company: *See—*
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Alburn, Harvey E.; Clark, Donald E.; Grant, Norman H.; and Lapidus, Milton, to American Home Products Corporation. Hydroxamic acid derivatives of 1-aminocyclohexanecarboxylic acid. 3,703,542, Cl. 260-500.50h.

Alburn, Harvey E.; Clark, Donald E.; Grant, Norman H.; and Lapidus, Milton, to American Home Products Corporation. Hydroxamic acids of alicyclic amono acids. 3,703,543, Cl. 260-500.50h.

Alessio, Sergio A.; Chow, Weichien; and Kosem, Marion, to Bunker-Ramo Corporation, The. Combined component and interconnection module and method of making. 3,703,033, Cl. 29-624.000.

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Esler, Donald F.; and Choby, Edward G., Jr., 3,703,419.

Allemand, Robert; Brey, Christian; and Jacobe, Jean, to Commissariat a l'Energie Atomique. Ionization radiation detector system for determining position of the radiation. 3,703,638, Cl. 250-83.60r.

Allen, Philip J., to United States of America, Navy. Optical rotary joint. 3,703,330, Cl. 350-157.000.

Allmanna Svenka Elektriska Aktiebolaget: *See—*
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Allmanna Svenska Elektriska Aktiebolaget: *See—*
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Alric, Andre A. L.; Porte, Gilbert R. A.; Glotin, Joseph M. H.; Higounenq, Francis J.; and Boussin, Serge P., to Societe Nationale Industrielle Aerospatiale. Floating battery charging network. 3,703,675, Cl. 320-31.000.

Alsup, Michael John; and Guevara, Alfredo Ruben, to Eastman Kodak Company. Processes and elements for preparation of photomechanical images. 3,703,373, Cl. 96-35.000.

Alterton, Lloyd E.: *See—*
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Altmann, Conrad: *See—*
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American Home Products Corporation: *See—*
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Analysis system employing a plural chamber cuvette: *See—*
Rosse, Thomas A.; Blackmer, David E.; Zindler, Jerrold; and Kelley, Thomas F., 3,703,336.

Anderson, Charles I. Rotary blade for mulching lawn mower. 3,703,071, Cl. 56-295.000.

Anderson, George J.; and Dahms, Wilbraham-Ronald, to Monsanto Company. Resolve varnishes wherein phenol is alkylated with a dicyclopentadiene-containing mixture and then condensed with formaidettyde to produce the resole. 3,703,494, Cl. 260-29.300.

Anderson, Harvey J.: *See—*
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Anderson, Lawrence K.; Feldman, Martin; and Pinnow, Douglas Arthur, to Bell Telephone Laboratories, Incorporated. High-speed printing apparatus. 3,703,137, Cl. 95-4.50r.

Andersson, Nils Eric: *See—*
Bylund, Per-Ake; Farkas, Tibor; and Andersson, Nils Eric, 3,703,668.

Andree, Walter: *See—*
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Antonen, Robert C.; Kookootsedes, Gust J.; and Field, Arthur J., to Dow Corning Corporation. Sulfonic acid containing organopolysiloxane compositions. 3,703,562, Cl. 260-825.500.

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Aoyagi, Takanobu: *See—*
Takayama, Yuzi; Ichimura, Yutaka; Minmmi, Shunsuke; Aoyagi, Takanobu; and Takeda, Fumio, 3,703,491.

Arai, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Air bag safety device for vehicle passengers. 3,703,702, Cl. 340-52.00r.

Araujo, Roger J.; Sawchuk, Loris G.; and Seward, Thomas P., III, to Corning Glass Works. High refractive index photochromic glasses. 3,703,388, Cl. 106-47.00r.

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Arnold, Soodalter. Sleeving apparatus. 3,703,065, Cl. 53-197.000.

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Aron-Samuel, Jan Marcel Didier; and Sterne, Jean Jacques. 1,3,5-Triazines. 3,703,514, Cl. 260-249.900.

Arrance, Frank C., to McDonnell Douglas Corporation. Flexible inorganic fibers and battery electrode containing same. 3,703,413 Cl. 136-6.000.

Arrow-Hart, Inc.: *See—*
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Bernaerts, Henry J., to United States of America, Navy. Propeller with after-collision propulsion capability. 3,703,211, Cl. 115-34.00r.

Bernholz, Edward L.: *See—*
Hemming, Charles B.; and Bernholz, Edward L., 3,703,394.

Beroff, Howard; and Richmond, Ernest L., to Ethicon, Inc. Electropolishing of drilled surgical needles. 3,703,452, Cl. 204-129.100.

Beyer, Henry R.; Long, Thomas F.; and De Sipio, Richard G., to United States of America, Navy. Sequence matrix. 3,703,719, Cl. 340-347.0dd.

Bhuta, Pravin G.; Johnson, Robert L.; and Graham, Douglas J., to TRW Inc. Surface tension method of and apparatus for separating immiscible liquids. 3,703,463, Cl. 210-23.000.

Biddle, Bilburn Emmett. Pet-tender. 3,703,160, Cl. 119-121.000.

Bird, Brian Michael; and Rawcliffe, Gordon Hindle, to National Research Development Corporation. Three-phase, induction-motor, speed-changing method and control circuit. 3,703,672, Cl. 318-227.000.

Birrer, George W.: *See—*
Rosa, Albert G.; and Birrer, George W., 3,703,417.

Black, Rexford E.: *See—*
Read, Benjamin Hays; and Black, Rexford E., 3,703,458.

Blackmer, David E.: *See—*
Rosse, Thomas A.; Blackmer, David E.; Zindler, Jerrold; and Kelley, Thomas F., 3,703,336.

Bliss & Laughlin Industries, Inc.: *See—*
Skupas, John A.; and Godwin, Robert H., 3,703,020.

Bliss & Laughlin Industries, Incorporated: *See—*
Ciepley, Ted, 3,703,683.

Blowers, William L., to Kollmorgen Corporation. Temperature-controlled integrated circuits. 3,703,651, Cl. 307-310.000.

Blueberry Equipment, Inc.: *See—*
Patzlaff, Albert W., 3,703,072.

Blytas, George C., to Shell Oil Company. Process for extracting copper, cobalt and nickel values from aqueous solution. 3,703,573, Cl. 423-24.000.

Bobeck, Andrew Henry; and Scovil, Henry Evelyn Derrick, to Bell Telephone Laboratories, Incorporated. Mass memory organization. 3,703,712, Cl. 340-174.0tf.

Boehm, Otto; and Scholz, Werner, to Werkzeugbau GmbH. Rock drilling bit. 3,703,214, Cl. 175-395.000.

Boehringer Ingelheim G.m.b.H.: *See—*

Walther, Gerhard; Bauer, Rudolf; Schulz, Werner; and Sirrenberg, Walther, 3,703,523.

Boone, John J.: *See—*
Samler, Lee F.; and Boone, John J., 3,703,197.

Booth, Jack J. Dispensing valve. 3,703,187, Cl. 137-114.000.

Borden, Inc.: *See—*
Bretch, Edward E., 3,703,378.

Bordenca, Carl, to SCM Corporation. Terphenylamino ethers and thioethers. 3,703,554, Cl. 260-583.0ee.

Borg-Warner Corporation: *See—*
Wise, George L.; and Russ, Mark A., 3,703,305.

Borrello, Sebastian R.: *See—*
Belasco, Melvin; and Borrello, Sebastian R., 3,703,408.

Bosch, Robert, G.m.b.H.: *See—*
Messerschmidt, Friedrich, 3,703,184.

Bose, Otindra Nath, to English Sewing Limited. Method of making a yarn containing loops. 3,703,075, Cl. 57-157.00r.

Bosquain, Maurice; Bourjot, Marcel; and Kirsch, Maurice, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitatirn des Procedes Georges Claude. Method for manufacturing very large heat exchangers. 3,703,028, Cl. 29-157.30r.

Bosshard, Ulrich Walter, to Holderbank Management & Consulting Ltd. Cooling apparatus for the outlet of a rotary kiln. 3,703,277, Cl. 263-44.000.

Botsford, Charles E.: *See—*
Poling, Ezar C.; and Botsford, Charles E., 3,703,428.

Boudakian, Max M., to Olin Corporation. Method for the preparation of stable 4-fluoropyridine salts. 3,703,521, Cl. 260-290.0hl.

Bourjot, Marcel: *See—*
Bosquain, Maurice; Bourjot, Marcel; and Kirsch, Maurice, 3,703,028.

Boussin, Serge P.: *See—*
Alric, Andre A. L.; Porte, Gilbert R. A.; Glotin, Joseph M. H.; Higounenq, Francis J.; and Boussin, Serge P., 3,703,675.

Bouthors, Pierre: *See—*
Remaud, Jacques C.; and Bouthors, Pierre, 3,703,320.

Bovett, Duane E., to Burroughs Corporation. Dual clock memory access control. 3,703,707, Cl. 340-172.500.

Bowker, David E.: *See—*
Charnock, Harry; and Bowker, David E., 3,703,424.

Bowring, David John, to G.K.N. Sankey Limited. Coin-operated vending machines. 3,703,229, Cl. 194-10.000.

Bozik, John E.; Swift, Harold E.; and Wu, Ching-Yong, to Goodrich-Gulf Chemicals Inc. Polymerization process and catalyst system therefor. 3,703,483, Cl. 260-2.00a.

BP Chemicals Limited: *See—*
Yeomans, Bertram, 3,703,549.

Braendstroem, Arne Elof; Carlsson, Stig Ake Ingemar; and Gagneux, Andre, to Geigy Chemical Corporation. 2-Aroyl-3-aminoalkoxy indoles. 3,703,524, Cl. 260-293.610.

Bratt, Richard L., to Norton Company. Surface conforming wear resistant doctor blade for rolls. 3,703,019, Cl. 15-256.510.

Bray, Horace A., to Dunlop Company Limited, The. Friction mechanisms containing silicon nitride. 3,703,224, Cl. 188-251.00m.

Bray, Thomas L.: *See—*
Cofer, Daniel B.; and Bray, Thomas L., 3,703,261.

Brda, Otto. Rescuing device. 3,703,218, Cl. 182-6.000.

Breidenbach, Josef: *See—*
Holler, Hans; Breidenbach, Josef; and Milles, Aloys, 3,703,590.

Breitkreuz, Lutz: *See—*
Dennewitz, Rolf Dieter; and Breitkreuz, Lutz, 3,703,662.

Breneman, Edwin J., to Kollmorgen Corporation. Veiling reflection and illumination meter. 3,703,338, Cl. 356-222.000.

Brennan, William R., to Chemed Corporation. Storage stable detergent composition. 3,703,470, Cl. 252-99.000.

Brenner, Abner; and Anderson, Harvey J., to United States of America, Atomic Energy Commission. Vapor deposition of rhenium and rhenium-tungsten alloy coatings. 3,703,405, Cl. 117-107.200.

Bretch, Edward E., to Borden, Inc. Snack food and method of producing same. 3,703,378, Cl. 99-81.000.

Brewer, Lee M., to General Motors Corporation. Flow divider control valve assembly. 3,703,186, Cl. 137-101.000.

Brewer, Robert W., to General Motors Corporation. Filler cap. 3,703,245, Cl. 220-40.00r.

Brey, Christian: *See—*
Allemand, Robert; Brey, Christian; and Jacobe, Jean, 3,703,638.

Brigham, Owsley H. Camera flash switch adapter. 3,703,131, Cl. 95-11.00l.

British Leyland Motor Corporation Limited: *See—*
Weaving, John Harold, 3,703,164.

British Oxygen Company Limited, The: *See—*
Doxey, Brian Cecil, 3,703,674.

Bromer, Heinz; and Meinert, Norbert, to Lietz, Ernst, G.m.b.H. Optical glass having a high refracting index and a high color dispersion. 3,703,389, Cl. 106-47.00q.

Brooks, Elwin W.: *See—*
Berger, Richard M.; and Brooks, Elwin W., 3,703,429.

Broussaud, Georges; and Lowenthal, Serge, to Thomson-CSF. Signal spectral multiplexing system. 3,703,640, Cl. 250-199.000.

Browall, Kenneth W.; and Interrante, Leonard V., to General Electric Company. Humidity sensor. 3,703,696, Cl. 338-35.000.

Brown, James, Jr.: *See—*
Zakaria, Moneeb; Raphaelian, Leo A.; Taber, David; and Brown, James, Jr., 3,703,471.

Brownstein, David W. Integrated in-line method of continuously casting metal. 3,703,204, Cl. 164-87.000.

Bryant, Thurman E.: *See—*
Reece, Thomas L.; and Bryant, Thurman E., 3,703,465.

Buckeye Steel Castings Company, The: *See—*
Furniss, Loree Elwyn, 3,703,239.

Bucky, Peter A. Key heater flashlight. 3,703,634, Cl. 240-10.6ch.

Bucolo, Iovanni; and David, Harold, to Calbiochem. Triglyceride hydrolysis and assay. 3,703,591, Cl. 195-103.50r.

Budich, Wolfgang; Theissen, Hans; Schaefer, Hans; and Andree, Walter, to Dynamit Nobel Aktiengesellschaft. Profile member for windows, doors, facades, or the like. 3,703,063, Cl. 52-727.000.

Buecheler, Paul; and Steiner, Karl Ulrich, to Sandoz Ltd. Dyeing synthetic polyamides with 1, 4-di-(hydroxyalkylamino) anthraquinones. 3,703,350, Cl. 8-39.000.

Buglov, Evgeny Danilovich: *See—*
Dovgalev, Stepan Ilich; Ermolenko, Igor Nikolaevich; Buglov, Evgeny Danilovich; Danilov, Ivan Petrovich; and Longin, Mikail Lvovich, 3,703,438.

Building Block Modules, Inc.: *See—*
Klett, George G.; and Akerstrom, Gary L., 3,703,058.

Buisson, Gerard: *See—*
Lamanche, Jean; and Buisson, Gerard, 3,703,396.

Bullock, John W., to Arrow-Hart, Inc. Contact operating mechanism for contact breaker. 3,703,694, Cl. 337-62.000.

Bundschuh, John J.; Roman, Robert J.; and Thomson, Kenneth W., to Eastman Kodak Company. Cinematographic cartridge projector apparatus. 3,703,333, Cl. 352-157.000.

Bunker-Ramo Corporation, The: *See—*
Alessio, Sergio A.; Chow, Weichien; and Kosem, Marion, 3,703,033.

Bunnell, Charles Milton. Scallop muscle and viscera preconditioner. 3,703,022, Cl. 17-53.000.

Bureau de Recherches Geologiques et Minieres: *See—*
Cohen-Alloro, Richard; Cuvillier, Roger; and Grassaud, Jean, 3,703,237.

Burkarth, Jack L., to E-System, Inc. Zoom light. 3,703,635, Cl. 240-44.100.

Burkhardt, Lawrence E.; and Johnson, Charles H., to United States of America, Navy. Selective arming mode and detonation option ordnance fuze. 3,703,145, Cl. 102-70.20r.

Burnett, Marvin D. Automatic disconnect for a vehicular battery. 3,703,617, Cl. 200-61.500.

Burroughs Corporation: *See—*
Bovett, Duane E., 3,703,707.
Shesser, Arthur B., 3,703,657.

Busch, Walter; and Schwarzer, Franz, to Kalle Aktiengesellschaft. Process for the preparation of a semipermeable membrane from polymerized β-lactams unsubstituted at the nitrogen atom. 3,703,570, Cl. 264-41.000.

Butzow, Neil W.; and Harris, Bernard. Method for making ball and socket type bearings in multiple. 3,703,421, Cl. 156-84.000.

Bylund, Per-Ake; Farkas, Tibor; and Andersson, Nils Eric, to Allmanna Svenska Elektriska Aktiebolaget. Semiconductor device with semiconductor element arranged side by side and provided with hollow coaling bodies. 3,703,668, Cl. 317-23.0ar.

Calbiochem: *See—*
Bucolo, Iovanni; and David, Harold, 3,703,591.

Cammarata, Italo: *See—*
Vecchio, Martino; Carraro, Giorgi; and Cammarata, Italo, 3,703,557.

Campbell, Edward E.; and Sandor, Bela, to General Motors Corporation. Closure latch. 3,703,308, Cl. 292-216.000.

Campbell, Herman W.: *See—*
Barker, Graham; and Campbell, Herman W., 3,703,481.

Canfield, William N.: *See—*
Vogel, John D.; and Canfield, William N., 3,703,288.

Canon Kabushiki Kaisha: *See—*
Goshima, Takeshi; and Miyasaka, Tooru, 3,703,129.
Kohtani, Yutaka, 3,703,041.

Carleton, Peter S.; and Farrissey, William J., Jr., to Upjohn Company, The. Adducts of ethylene carbonate and triethylenediamine. 3,703,520, Cl. 260-268.00t.

Carlos, Donald Dante; and Shimp, David Alan, to Celanese Coatings Company. Oximes as accelerators for the amine curing of epoxy resins. 3,703,497, Cl. 260-47.5en.

Carlsson, Stig Ake Ingemar: *See—*
Braendstroem, Arne Elof; Carlsson, Stig Ake Ingemar; and Gagneux, Andre, 3,703,524.

Carraro, Giorgi: *See—*
Vecchio, Martino; Carraro, Giorgi; and Cammarata, Italo, 3,703,557.

Carrier Corporation: *See—*
Czuszak, Charles C., 3,703,339.
Gutheim, August W., 3,703,140.
Macleod, David E., 3,703,087.
Worthen, Richard A., 3,703,183.

Carroll, Patrick J.: *See—*
Spurlin, William V.; and Carroll, Patrick J., 3,703,236.

Carson, William N., Jr.; and Manganaro, James L., to General Electric Company. Method of generating hydrogen with magnesium reactant. 3,703,358, Cl. 23-211.000.

Cartelli, Joseph M. Lighted display box having means for encasing lamp structure. 3,703,720, Cl. 340-381.50r.

Carter, Bob A., to Southern Cross Corporation. Portable flame ionization gas leak detector. 3,703,356, Cl. 23-254.0ef.

Casadio, Silvano; and Pala, Gianfranco, to Istituto de Angeli S.p.A. 1,2-Diphenyl-3,5-dioxo-4-substituted pyrazolidines. 3,703,528, Cl. 260-310.00b.

Casadio, Silvano; and Pala, Gianfranco, to Istituto de Angeli S.p.A. 19-Nortestosterone esters. 3,703,534, Cl. 260-397.400.

Castellano, Joseph Anthony, to RCA Corporation. Liquid crystal color display. 3,703,329, Cl. 350-150.000.

Castor, William M.: *See—*
Turley, Robert R.; Castor, William M.; and Nunnally, Kenneth R., 3,703,593.

Caterpillar Tractor Company: *See—*
Wagner, Harold H., 3,703,663.

Cavalla, John Frederick,; Simpson, Roy; and White, Alan Chapman, to Wyeth, John, & Brother Limited. Nitrogen-containing tricyclic compounds. 3,703,529, Cl. 260-326.50b.

Celanese Coatings Company: *See—*
Carlos, Donald Dante; and Shimp, David Alan, 3,703,497.
McCartney, Roger L., 3,703,501.

Celanese Corporation: *See—*
Di Pietro, Joseph, 3,703,392.
Levy, Leon B., 3,703,551.

Cella, John A.; and Schmitt, William H., to Alberto-Culver Company. Tooth paste having improved tooth cleaning properties. 3,703,578, Cl. 424-49.000.

Cellu Products Company: *See—*
Doll, Brendan L., 3,703,116.

Ceraver: *See—*
Willem, Michel, 3,703,606.

Champion International Corporation: *See—*
Hemming, Charles B.; and Bernholz, Edward L., 3,703,394.
Luebs, Donald F.; and Ashby, Frederick R., 3,703,198.

Chana, Howard E., to General Motors Corporation. Accumulator for hydraulically operated friction clutch or brake unit. 3,703,228, Cl. 192-85.00r.

Chapman, Howard D., to Clarin Corporation. Collapsible arm chair. 3,703,312, Cl. 297-35.000.

Charnock, Harry; and Bowker, David E., to Dunlop Holdings Limited. Method of producing a wear-resistant area in a surface-covering material. 3,703,424, Cl. 156-272.000.

Chartered Enterprises, mesne: *See—*
Leach, George J., 3,703,013.

Chemed Corporation: *See—*
Brennan, William R., 3,703,470.

Cherubim, Martin; Giehring, Horst; and Neier, Wilhelm, to Deutsche Texaco Aktiengesellschaft. Manufacture of basic nitrogen and hydroxyl containing epoxide resins. 3,703,531, Cl. 260-348.600.

Chess, Samuel; and Cleveland, Bruce B., to Upjohn Company, The. Water-scavenging composition for hydraulic fluids. 3,703,468, Cl. 252-77.000.

Chevron Research Company: *See—*
Ferm, Richard L., 3,703,464.
Vitter, Albert L., Jr.; and McDonald, Hugh G., 3,703,096.

Chisso Corporation: *See—*
Inoi, Takeshi; Sueyoshi, Koji; Fujii, Masahiro; Shoji, Kenjiro; Shudo, Akio; Yoshizaki, Takayoshi; and Yutaka, Matsuo, 3,703,518.

Choby, Edward G., Jr.: *See—*
Esler, Donald F.; and Choby, Edward G., Jr., 3,703,419.

Choisser, John P. Apparatus for photocathode processing. 3,703,155, Cl. 118-48.000.

Chow, Weichien: *See—*
Alessio, Sergio A.; Chow, Weichien; and Kosem, Marion, 3,703,033.

Ciba-Geigy AG: *See—*
Dobinson, Bryan; Hope, Paul; Winterbottom, Kenneth; and Shaw, Trevor, 3,703,352.
Grelat, Maurice, 3,703,533.

Ciba-Geigy Corporation: *See—*
Heusler, Karl; and Woodward, Robert Burns, 3,703,512.
Rothweiler, Werner B., 3,703,597.

Ciepley, Ted, to Bliss & Laughlin Industries, Incorporated. Limited pivotal handle assembly for furniture components. 3,703,683, Cl. 16-126.000.

Cilag-Chemie, A.G.: *See—*
Richter, Carl; Pluss, Kurt; and Feth, Georg, 3,703,537.

Cincinnati Milacron-Heald Corporation: *See—*
Uhtenwoldt, Herbert R., 3,703,054.

Circuit-Stik, Inc.: *See—*
Levesoue, Norman R.; and Harper, Donald E., 3,703,603.

Cities Service Company: *See—*
Green, Joseph; Roth, Shirley H.; and Seipel, John J., 3,703,487.
Levine, Ralph, 3,703,558.
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Roth, Shirley H., 3,703,410.

Clarin Corporation: *See—*
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Clark, Donald E.: *See—*
Alburn, Harvey E.; Clark, Donald E.; Grant, Norman H.; and Lapidus, Milton, 3,703,542.
Alburn, Harvey E.; Clark, Donald E.; Grant, Norman H.; and Lapidus, Milton, 3,703,543.

Clauss, Richard J.; Tremmel, Robert; and Becking, Donald H., to Oxy Metal Finishing Corporation, mesne. Method of making composite nickel electroplate and electrolytes therefor. 3,703,448, Cl. 204-40.000.

Clement, John C., to Ocean Design Engineering Corporation. Biased taut line mooring system. 3,703,151, Cl. 114-230.000.

Cleveland, Bruce B.: *See—*
Chess, Samuel; and Cleveland, Bruce B., 3,703,468.

Clishem, Thomas A.; Duerr, Francis r.; and Olympia, Frederick D., to Corhart Refractories Company. Electric melting furnace and process of using it. 3,703,391, Cl. 106-57.000.

Coal Industry (Patents) Limited: *See—*
Trolley, John Henry, 3,703,315.

Coaxial Scientific Corporation: *See—*
Mc Voy, David S., 3,703,684.

Cocks, Franklin H., to Tyco Laboratories, Inc. Copper-zinc alloys. 3,703,367, Cl. 75-157.500.

Cofer, Daniel B.; and Bray, Thomas L., to Southwire Company. Orbital coiler. 3,703,261, Cl. 242-82.000.

Coglianese, Fred A.; and Mc Corkle, John E., to Johns-Manville Corporation. Polyurethane foam. 3,703,482, Cl. 260-2.5ak.

Cohen, Herbert I., to Acron Corporation. Telephone dialing and information transmission circuit. 3,703,607, Cl. 179-5.00p.

Cohen-Alloro, Richard; Cuvillier, Roger; and Grassaud, Jean, to Bureau de Recherches Geologiques et Minieres. Differential-effect backing vat for coarse and fine particles. 3,703,237, Cl. 209-426.000.

Cohn, Harold P.: *See—*
Wickman, Miles X.; and Cohn, Harold P., 3,703,682.

Colburn, William H., Jr., to Space Ordnance Systems, Inc., mesne. Delay composition and device. 3,703,144, Cl. 102-24.000.

Cole, Herbert S., Jr., to General Electric Company. Electron sensitive compositions. 3,703,402, Cl. 117-37.00r.

Colgate-Palmolive Company: *See—*
Grand, Paul Sheldon; and Wixon, Harold Eugene, 3,703,480.

Collins Radio Company: *See—*
Heidt, Marvin W., 3,703,679.

Colorado Technologists Incorporated: *See—*
White, Michael W., Jr.; and Plamondon, Jacques A., 3,703,166.

Combustion Unlimited, Incorporated: *See—*
Straitz, John F., III, 3,703,349.

Commissariat a l'Energie Atomique: *See—*
Allemand, Robert; Brey, Christian; and Jacobe, Jean, 3,703,638.
Goff, Denis Le, 3,703,661.

Compagnie de Saint-Gobain: *See—*
Lamanche, Jean; and Buisson, Gerard, 3,703,396.

Compagnie Generale d'Electricite: *See—*
Jacquelin, Jean, 3,703,416.

Compur-Werk Gesellschaft mit beschrankter Haftung & Co.: *See—*
Schwarz, Gerhard, 3,703,136.

Conley and Kleppen Enterprises, Inc.: *See—*
Kleppen, Arthur L., Jr., 3,703,622.

Construction Products Corporation: *See—*
Jones, David P., 3,703,219.

Continental Oil Company: *See—*
Kerfoot, Oliver C.; and Duchmann, George W., 3,703,559.
Sias, Roy C., 3,703,475.

Cook Electric Company: *See—*
Yereance, Robert A.; and Erlenbach, Harold W., Jr., 3,703,665.

Cooper, Julius, to Ideal Toy Corporation. Toy robot. 3,703,048, Cl. 46-148.000.

Cordes, Linus F., to General Electric Company. Method of making resistor thin films by reactive sputtering from a composite source. 3,703,456, Cl. 204-192.000.

Corhart Refractories Company: *See—*
Clishem, Thomas A.; Duerr, Francis r.; and Olympia, Frederick D., 3,703,391.

Corning Glass Works: *See—*
Araujo, Roger J.; Sawchuk, Loris G.; and Seward, Thomas P., III, 3,703,388.
Fyler, Norman F., 3,703,660.
Kunz, Hans J., 3,703,670.
Melezoglu, Cevdet, 3,703,411.
Stephenson, Donald A., 3,703,726.

Council on Library Resources, Inc., mesne: *See—*
Kusterer, James E., Jr.; and Hind, John D., 3,703,353.

Cowles, John O.: *See—*
Heckman, Richard A.; and Cowles, John O., 3,703,208.

Cowpland, Michael C. J., to Microsystems International Limited. Voltage clipping circuit. 3,703,647, Cl. 307-237.000.

Cree, George Benson, Jr. Brake press die system, structure and processes. 3,703,094, Cl. 72-389.000.

Creusot-Loire: *See—*
Babel, Louis, 3,703,601.

Cripe, Maxwell L., to Bendix Corporation, The. Vacuum pumping device. 3,703,077, Cl. 60-51.000.

Cronin, John C., to I-T-E Imperial Corporation. Fault current limiter using superconductive element. 3,703,664, Cl. 317-20.000.

Cubb-Pac Corporation: *See—*
Lugiewicz, Robert C., 3,703,064.

Cullom, John T. Process for producing copper and elemental sulfur. 3,703,366, Cl. 75-74.000.

Cummisford, Patricia D.; and Beck, Charles I., to General Mills, Inc. Double expanded food products. 3,703,379, Cl. 99-81.000.

Curtis, Rolando T., to Integrated Ceilings, Inc. Connector structure for suspended ceilings and the like. 3,703,307, Cl. 287-189.36r.

Cuvillier, Roger: *See—*
Cohen-Alloro, Richard; Cuvillier, Roger; and Grassaud, Jean, 3,703,237.

Cyr, Gilman N.: *See—*
Riffkin, Charles; Rifino, Carl B.; and Cyr, Gilman N., 3,703,511.

Czuszak, Charles C., to Carrier Corporation. Turbine speed control system. 3,703,339, Cl. 415-36.000.

Dahlstrom, Karl L.: *See—*
Davis, Robert W.; and Dahlstrom, Karl L., 3,703,311.

Dahms, Wilbraham-Ronald: *See—*
Anderson, George J.; and Dahms, Wilbraham-Ronald, 3,703,494.

Daicel Ltd.: *See—*
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Daimler-Benz Aktiengesellschaft: *See—*
Lamm, Heinz, 3,703,163.
Schiesterl, Gerhard; and Wulf, Helmut, 3,703,313.
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Daley, Thomas Joseph: *See—*
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Danilov, Ivan Petrovich: *See—*
Dovgalev, Stepan Ilich; Ermolenko, Igor Nikolaevich; Buglov, Evgeny Danilovich; Danilov, Ivan Petrovich; and Longin, Mikail Lvovich, 3,703,438.

Data Recognition Corporation: *See—*
Shanrock, Raymond L., 3,703,626.

David, Harold: *See—*
Bucolo, Iovanni; and David, Harold, 3,703,591.

Davies, Robert William, to Molins Limited. Mechanism for producing rectilinear motion. 3,703,103, Cl. 74-86.000.

Davis, David E., to Midwest Steel Fabricators, Inc. Aggregate dryer for asphalt plant. 3,703,274, Cl. 263-30.000.

Davis, David S.; and Kim, Young K., to Witco Chemical Corporation. Halogenation of hydroxyaryl sulfones. 3,703,556, Cl. 260-607.00a.

Davis, Robert W.: *See—*
Davis, Robert W.; and Dahlstrom, Karl L. (said Dahlstrom assor. to said), 3,703,311.

Davis, Robert W.; and Dahlstrom, Karl L., said Dahlstrom assor. to said Davis, Robert W. Tent camping trailer. 3,703,311, Cl. 296-23.00r.

De Rees, Delbert D.; and Walker, Gerald R., to General Motors Corporation. Vehicle window installation. 3,703,053, Cl. 49-428.000.

De Sipio, Richard G.: *See—*
Beyer, Henry R.; Long, Thomas F.; and De Sipio, Richard G., 3,703,719.

De Vries, Robert C.; and Fleischer, James F., to General Electric Company. Thermistors. 3,703,478, Cl. 252-521.000.

Deal, Samuel Broughton; and Bartch, Donald Walter, to RCA Corporation. Method for preparing the viewing-screen structure of a cathode-ray tube. 3,703,401, Cl. 117-33.5cp.

Deboeur, Francois Fernand; and Plumhans, Paul Jean, to Uniroyal Aktiengesellschaft. Mold for vulcanizing pre-shaped pneumatic tires. 3,703,346, Cl. 425-46.000.

Deep Oil Technology, Inc.: *See—*
Horton, Edward E., 3,703,207.

Deering Milliken Research Corporation: *See—*
Klein, Norman E., 3,703,154.
Lock, Michael V., 3,703,351.

Del Mar Engineering Laboratories: *See—*
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Delmonte, John; Meadows, Paul L.; and Benavides, Augusto E., to Furane Plastics Incorporated. Method of making transparent laminated structure having transplant interlayer. 3,703,425, Cl. 156-245.000.

Dembiak, Matthew R.; and Webster, George H., said Dembiak assor to Western Electric Company, Incorporated and said Webster assor to Bell Telephone Laboratories, Incorporated. Communications cables with sealed metallic moisture barriers. 3,703,605, Cl. 174-07.000.

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Denisov, Nikolai Timofeevich; Efimov, Oleg Nikolaevich; Shuvalov, Viktor Fedorovich; Shuvalova, Natalia Ivanovna; Shilova, Alla Konstantinovna; and Shilov, Alexandr Evgenievich, to Filial Ordena Lenina Institut Khimicheskoi Fiziki ANSSR. Method of producin hydrazine. 3,703,354, Cl. 23-190.00r.

Denki Kagaku Kogyo Kabushiki Kaisha: *See—*
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Masuda, Shiro; Ohkubo, Takashi; and Furukawa, Yu, 3,703,492.

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Dennewitz, Rolf Dieter; and Breitkreuz, Lutz, to Loewe Opta G.m.b.H. High speed quenching arrangement for a flash device. 3,703,662, Cl. 315-159.000.

Derouin, David J.: *See—*
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Di Liddo, Bart A., to Goodrich, B. F., Company, The. Preparation of esters of unsaturated mono-carboxylic acids. 3,703,539, Cl. 260-486.00r.

Di Pietro, Joseph, to Celanese Corporation. Shaped articles of improved dyeability. 3,703,392, Cl. 106-177.000.

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Dingwall, Andrew Gordon Francis, to RCA Corporation. Shaped riser on substiate step for promoting metal film continuity. 3,703,667, Cl. 317-234.00r.

Dixon, Ted A. Nebulizer and tent assembly. 3,703,173, Cl. 128-194.000.

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Doll, Brendan L., to Cellu Products Company. Method and apparatus for slitting sheet material. 3,703,116, Cl. 83-17.000.

Dover Corporation, mesne: *See—*
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Dovgalev, Stepan Ilich; Ermolenko, Igor Nikolaevich; Buglov, Evgeny Danilovich; Danilov, Ivan Petrovich; and Longin, Mikail Lvovich, to Belorussky Institut Perelivania Krovi. Method for the stabilization of blood. 3,703,438, Cl. 195-1.800.

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Drexler, Rodger A.; and Altmann, Conrad, to Eastman Kodak Company. Method for development of electrostatic images. 3,703,395, Cl. 117-17.500.

du Pont, Michael H.: *See—*
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Farrington, Dale A.; and Vandevord, George E., to General Electric Company. Muzzle brake torque assist for multi-barrel weapons. 3,703,122, Cl. 89-14.00c.

Farrissey, William J., Jr.: *See—*
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Frank, Kjell, to Allmanna Svenska Elektriska Aktiebolaget. Inverter. 3,703,676, Cl. 321-5.000.

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Goldmacher, Joel E.; and Heilmeier, George H., to RCA Corporation. Liquid crystal display element having storage. 3,703,331, Cl. 350-160.0lc.
Gomersall, Earl Raymond; Meyer, Roger Paul; and Rejmaniak, Susan English, to Texas Instruments, Incorporated. Method for operating a manufacturing line. 3,703,725, Cl. 444-1.000.
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Griot, Rudolf G., to Sandoz-Wander, Inc. 3,4-Piphenyl-1-(4-hydroxyphenyl)-cyclopentane. 3,703,560, Cl. 260-619.00d.

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Hanbicki, Richard B., to Madatron Corporation. Pneumatically operated counting device. 3,703,629, Cl. 235-98.000.

Handy, Everett L. Cable stripper. 3,703,035, Cl. 30-90.900.

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Hasselbohm, Sune Sigurd Sixten, to Telefonaktiebolaget L M Ericsson. Terminal block for slot connection of insulated conductors. 3,703,700, Cl. 339-198.00r.

Hatcher, Cecil W.; and Warner, Gene. Pavement cutting machine. 3,703,316, Cl. 299-39.000.

Haug, Albert, to Societe d'Etudes de Machines Thermiques. Internal combustion engine piston. 3,703,126, Cl. 92-186.000.

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Healy, Thomas Victor; and Pilbeam, Alan, to United Kingdom Atomic Energy Authority. Solvent extraction and electrowinning of copper. 3,703,451, Cl. 204-106.000.

Heaton, Richard A.; and Mallory, James D., to Owens-Illinois, Inc. Method and apparatus for making glass container. 3,703,363, Cl. 65-67.000.

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Henry, Jean-Claude, to Merlin Gerin, Societe Anonyme. Compressed gas circuit interrupter having a closed-cycle high pressure heating circulation. 3,703,619, Cl. 200-148.00e.

Henschen, Homer Ernst; and Zell, Dale Richard, to AMP Incorporated. Flat conductor transmission cable. 3,703,604, Cl. 174-75.00r.

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Hesen, Joseph A., to Del Mar Engineering Laboratories. Diagnostic and therapeutic exercise treadmill. 3,703,284, Cl. 272-69.000.
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Jacquelin, Jean, to Compagnie Generale d'Electricite. Basic cell operating with hydrocarbon fuel. 3,703,416, Cl. 136-86.00r.
Jacyno, Anthony, to Murphy, G. W., Industries, Inc. Electric tool with its circuit components shielded from the motor parts. 3,703,646, Cl. 310-47.000.
Jaggers, William: *See*—
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Johnson, Gary N.; and Wilson, Larry E., to Honeywell Inc. Thin film line sensor for measuring magnetic field, pressure, vibration or physical displacement. 3,703,681, Cl. 324-43.00r.
Johnson, Gary R.: *See*—
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Jones, Giffin D.; and Tefertiller, Nancy B., to Dow Chemical Company, The. Dimerization of 2-aminomethyl-1, 3-butadiene. 3,703,553, Cl. 260-563.00r.
Jones, Loyd W., to Pan American Petroleum Corporation. Corrosion inhibitor containing sulfurized tall oil. 3,703,477, Cl. 252-39?.000.
Jordan, John E., to Tennessee Valley Authority. Production of oil-prilled fertilizer materials. 3,703,364, Cl. 71-29.000.
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Kaltenegger, Benno. Rigid base earth compactor. 3,703,127, Cl. 94-48.000.
Kamb, Roy A.; and Fikse, Tyman H. Concrete casting apparatus. 3,703,271, Cl. 249-34.000.
Kammerer, Archer W., Jr.; and Johnson, Gary R., to Baker Oil Tools, Inc. Mud saver apparatus. 3,703,213, Cl. 175-318.000.
Kaneko, Shin-Ichi: *See*—
Yamamoto, Hisao; and Kaneko, Shin-Ichi, 3,703,513.
Karll, Robert E.: *See*—
Piasek, Edmund J.; Karll, Robert E.; and Lee, Richard J., 3,703,536.
Karubian, Ralph. Separable connection means for reciprocating saw blades. 3,703,036, Cl. 30-339.000.
Karubian, Ralph. Hand tool with magnetic brake. 3,703,654, Cl. 310-77.000.
Kassat, Harry; Kissel, Ernst; and Kolenda, Herbert, to Gea Luftkuhlergesellschaft Happel GmbH & Co. KG. Condenser for low boiling fractions in rectifying or distilling columns. 3,703,592, Cl. 202-185.00b.
Kawamura, Takao, to Hitachi, Ltd. Color cathode ray tubes of the shadow mask type. 3,703,655, Cl. 313-85.00s.
Kayashibara Company: *See*—
Okada, Shigetaka; Tsuyama, Naoto; Kurimoto, Masahi; and Sugimoto, Kaname, 3,703,440.
Keeney, Lawrence V.: *See*—
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Keil, Joseph W., to Dow Corning Corporation. Process for foaming organic liquids. 3,703,486, Cl. 260-2.5ah.
Kelley, Matthias F., Jr.: *See*—
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Kelly, Clifford J.; and Hukee, Bernard J., Jr., to Kalium Chemicals Limited. Method of storing particulate matter. 3,703,241, Cl. 214-152.000.

Kelly, Robert C., to Upjohn Company, The. Alkyl-2-alkyl-2,3-dicarboxy-5-norbornene-7-acetate intermediates for the total synthesis of elenolic acids and analogs thereof. 3,703,530, Cl. 260-346.600.

Kemper, Wayne G. Decorative plastic wall tile. 3,703,431, Cl. 161-6.000.

Kendall, Larry J., to Signetics Corporation. Integrated circuit with temperature compensation for a field effect transistor. 3,703,650, Cl. 307-310.000.

Kent, William C., to Western Electric Company, Incorporated. Apparatus for forming wire springs and welding contacts to the springs. 3,703,029, Cl. 29-208.00d.

Kerfoot, Oliver C.; and Duchmann, George W., to Continental Oil Company. Purification of detergent alkylates. 3,703,559, Cl. 260-674.00a.

Kern, Dale W., to Riegel Textile Corporation. Simulated pre-folded diaper construction. 3,703,175, Cl. 128-284.000.

Keshi, Akizo; Yoshii, Kunio; Yokoo, Makoto; and Nakai, Kaichi, to Takeda Chemical Industries, Ltd. Polyurethane foam process using distannoxane/ aminoalochol catalyst combination. 3,703,484, Cl. 260-2.5ac.

Kessler, Milton. Extensible perforate floor mat and friction device. 3,703,059, Cl. 52-177.000.

Kesten, Patrick N.; Webb, Richard A.; and Bedford, Raymond E., to General Motors Corporation. Method for processing resistor glass seal compositions employing organic liquid. 3,703,387, Cl. 106-46.000.

Kieley & Mueller, Inc.: *See—*
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Kikuchi, Ken: *See—*
Murakami, Tadao; Kikuchi, Ken; Tomozaki, Riyouzou; and Ohuchi, Yasushi, 3,703,227.

Kikuchi, Makoto; and Suzuki, Isao, to Toyoda Koki Kabushiki Kaisha. Inspecting system with a branch chute for sampling finished workpieces. 3,703,100, Cl. 73-423.00r.

Kilpatrich, Stanley A.; and Niethammer, Woodard A., to Kaiser Aluminum & Chemical Corporation. Method and system for measuring sheet flatness. 3,703,097, Cl. 73-159.000.

Kim, Dong H.; and Santilli, Arthur A., to American Home Products Corporation. 7-Alkyl-2,5-disubstituted-7H-pyrrolo[2,3,α] pyrimidine-6-carbonitriles. 3,703,516, Cl. 260-256.50r.

Kim, Dong H.; and Santilli, Arthur A., to American Home Products Corporation. 4-[Carboxyalkyl)amino]-5-pyrimidinecarboxylic acid esters. 3,703,517, Cl. 260-256.40n.

Kim, Young K.: *See—*
Davis, David S.; and Kim, Young K., 3,703,556.

Kimura, Hiroshiro: *See—*
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Kirk, William W., to Upjohn Company, The. Coated seeds and process for coating seeds. 3,703,404, Cl. 117-72.000.

Kirsch, Maurice: *See—*
Bosquain, Maurice; Bourjot, Marcel; and Kirsch, Maurice, 3,703,028.

Kishikawa, Zitsuichi; and Maekawa, Sadafumi, to Nihon Nohyku Kabushiki Kaisha. Insecticidal phosphoric acid esters. 3,703,599, Cl. 424-217.000.

Kissel, Ernst: *See—*
Kassat, Harry; Kissel, Ernst; and Kolenda, Herbert, 3,703,592.

Kitajima, Masao; Tsuneoka, Yoozi; and Kondo, Asaji, to Fuji Photo Film Co., Ltd. Method of producing micro-capsules enclosing acetylsalicylic acid therein. 3,703,576, Cl. 424-35.000.

Kiyomiya, Hiromoto; Fukumiya, Yukio; Aoki, Mithuzi; and Mama, Hiromichi, to Hitachi, Ltd. and Hitachi Electronics Engineering Co., Ltd. Telephone system. 3,703,611, Cl. 179-99.000.

Klein, Norman E., to Deering Milliken Research Corporation. Coating apparatus. 3,703,154, Cl. 118-6.000.

Kleppen, Arthur L., Jr., to Conley and Kleppen Enterprises, Inc. Gas-shielded arc torch. 3,703,622, Cl. 219-75.500.

Klett, George G.; and Akerstrom, Gary L., to Building Block Modules, Inc. Modular building construction and erection system utilizing selectively oriented modules. 3,703,058, Cl. 52-79.000.

KMS Industries, Inc.: *See—*
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Knechtel, Wilhelm Josef; and Schaffer, Detlef. Electrophotographic apparatus. 3,703,334, Cl. 355-11.000.

Knowlton, Kenneth Charles, to Bell Telephone Laboratories, Incorporated. Method for generating random numerical quantities. 3,703,727, Cl. 444-1.000.

Kober, AG, Firma: *See—*
Koester, Waldemar, 3,703,014.

Koester, Waldemar, to Kober, AG, Firma. Tiltable bearing means, especially for bridges. 3,703,014, Cl. 14-16.000.

Kohashi, Tadao: *See—*
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Kohtani, Yutaka, to Canon Kabushiki Kaisha. Magnetic teaching machine with selectively operable repetitive and non-repetitive learning modes. 3,703,041, Cl. 35-35.00c.

Kojima, Katsumi: *See—*
Nakase, Yoshiaki; Yoshida, Masaru; Ito, Akihiko; Iwai, Tadashi; Hayashi, Koichiro; Okamura, Seizo; and Kojima, Katsumi, 3,703,454.

Kolenda, Herbert: *See—*
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Koller, Floyd G., to Auto-Valve, Inc. Drain valve. 3,703,189, Cl. 137-329.060.

Kollmorgen Corporation: *See—*
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Komatsu, Noboru; Suzuki, Takatoshi; Ito, Takuo; Hara, Yoshiteru; and Asakura, Kouichi, to Aisin Seiki Kabushika Kaisha and Kabushiki Kaisha Toyota Chuo Kenkyusho. Process and apparatus for performing a simultaneous and combined press-forming and heat-treatent of steel stock. 3,703,093, Cl. 72-342.000.

Komurao, Isao: *See—*
Nakano, Mamoru; Kadowaki, Koju; Komurao, Isao; Koshikawa, Takeo; and Oshida, Bunzi, 3,703,550.

Kondo, Asaji: *See—*
Kitajima, Masao; Tsuneoka, Yoozi; and Kondo, Asaji, 3,703,576.

Konecky, Milton S., to Esso Research and Engineering Company. Decahydroacenaphthene as a high energy fuel. 3,703,361, Cl. 44-80.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Sakazume, Kaiichiro; Sakamoto, Eiichi; Itoh, Shigemasa; Fujimori, Noboru; and Baba, Shigeji, 3,703,377.

Kookootsedes, Gust J.: *See—*
Antonen, Robert C.; Kookootsedes, Gust J.; and Field, Arthur J., 3,703,562.

Koons, Russell E., to Monsanto Company. Asphaltic compositions. 3,703,393, Cl. 106-279.000.

Korenicki, William John: *See—*
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Kosem, Marion: *See—*
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Koshikawa, Takeo: *See—*
Nakano, Mamoru; Kadowaki, Koju; Komurao, Isao; Koshikawa, Takeo; and Oshida, Bunzi, 3,703,550.

Koski, John T. Rainproof ventilated plastic sheet material for rainwear and method of making same. 3,703,432, Cl. 161-110.000.

Kostur, Nykola. Grain dispensing apparatus. 3,703,247, Cl. 222-442.000.

Kovats, Andre. Gas turbine locomotive. 3,703,146, Cl. 105-61.500.

Krauss & Reichert Spezialmachinenfabrik: *See—*
Langhoff, Boris, 3,703,056.

Krauss, Paul; and Igel, Wolfgang, to Zinser-Textilmaschinen Gesellschaft mit beschrankter Haftung. Apparatus for rendering textile slivers uniform. 3,703,023, Cl. 19-240.000.

Krausz, Johann; and Feichtinger, Johan, to Vereinigte Osterreichische Eisen- und Stahlwerk Aktiengesellschaft. Method for the production or restoration of working rolls for hot rolling of metallic flat products. 3,703,057, Cl. 51-326.000.

Krebs, James N.; and Paulson, Elmir E., to General Electric Company. Gas turbine engine. 3,703,081, Cl. 60-226.00r.

Krummen, Eugene V.: *See—*
Goodrich, Calvin C.; and Krummen, Eugene V., 3,703,067.

Kubicek, Donald H.; and Zuech, Ernest A., to Phillips Petroleum Company. Olefin conversion using complexes of Cu, Ag and Au with organoaluminums. 3,703,561, Cl. 260-683.00d.

Kubo, Masaharu; Hori, Ryoichi; and Nagata, Minoru, to Hitachi, Ltd. Semiconductor memory. 3,703,710, Cl. 340-173.0ff.

Kuchenbecker, Morris William, to American Can Company. Food product package. 3,703,383, Cl. 99-171.000.

Kuhle, Engelbert: *See—*
Nast, Roland; Kuhle, Engelbert; and Abele, Manfred, 3,703,500.

Kulick, Bruno; and Lamneck, Karlheinz, to Lansing Bagnall Limited. Vehicle with manually operated steering system. 3,703,217, Cl. 180-99.000.

Kumamoto, Riyouzi: *See—*
Ogata, Nobutaka; Kumamoto, Riyouzi; and Asada, Shuzi, 3,703,043.

Kunz, Hans J., to Corning Glass Works. Electroluminescent diode configuration and method of forming the same. 3,703,670, Cl. 317-235.00r.

Kuraray Co., Ltd.: *See—*
Ohnishi, Shigekazu; Nishishita, Masaharu; and Takimoto, Hisateru, 3,703,403.

Kurimoto, Masahi: *See—*
Okada, Shigetaka; Tsuyama, Naoto; Kurimoto, Masahi; and Sugimoto, Kaname, 3,703,440.

Kuster, Karl H., to GTE Automatic Electric Laboratories Incorporated. Voltage/frequency ratio monitor for A.C. signals. 3,703,717, Cl. 340-253.00y.

Kusterer, James E., Jr.; and Hind, John D., to Council on Library Resources, Inc., mesne. Gaseous diffusion paper deacidification. 3,703,353, Cl. 21-58.000.

Kutchma, Edward K. Ski teaching aid. 3,703,299, Cl. 280-11.37e.

Kutino, Tsuyoshi: *See—*
Yamagishi, Hidehisa; Yokoi, Fumitoshi; and Kutino, Tsuyoshi, 3,703,407.

Kuwada, Yutaka: *See—*
Tawada, Hiroyuki; Meguro, Kanji; and Kuwada, Yutaka, 3,703,525.

La Chance, Murdock H., to Xerox Corporation. Method of hermetically sealing silicon to a low expansion alloy. 3,703,306, Cl. 287-189.365.

Labtron Corporation of America: *See—*

Simopoulos, Nicholas T.; and Tsui, James B. Y., 3,703,685.

Laforest, Jean; and Miton, Pierre, to Rhone-Poulenc S.A. Dialysers and spacer frames therefor. 3,703,466, Cl. 210-321.000.

Lahm, James; and Hill, Robert D., Jr., to Spectrol Electronics Corporation. Trimmer potentiometer having means for lead screw misalignment compensation. 3,703,699, Cl. 338-180.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitatirn des Procedes Georges Claude: *See*—
Bosquain, Maurice; Bourjot, Marcel; and Kirsch, Maurice, 3,703,028.

Lamanche, Jean; and Buisson, Gerard, to Compagnie de Saint-Gobain. Apparatus for manufacturing products composed of fibers agglomerated with synthetic resins. 3,703,396, Cl. 117-21.000.

Lamm, Heinz, to Daimler-Benz Aktiengesellschaft. Rotary piston internal combustion engine. 3,703,163, Cl. 123-8.090.

Lamneck, Karlheinz: *See*—
Kulick, Bruno; and Lamneck, Karlheinz, 3,703,217.

Lang, Paul Wentworth, 1/2 to du Pont, Michael H. Multiple image film exposure and projection system. 3,703,135, Cl. 95-36.000.

Langhans, Roy Kenneth, to ICI America Inc. Baking process using polyoxyethylene fatty ethers as softeners and conditioners. 3,703,380, Cl. 99-91.000.

Langhoff, Boris, to Krauss & Reichert Spezialmachinenfabrik. Knife grinding device for a motor-driven cutting tool. 3,703,056, Cl. 51-246.000.

Langston, Benny: *See*—
Salmon, David; Wierzbicki, Edward J.; Langston, Benny; and Beegle, Donald W., 3,703,340.

Lansing Bagnall Limited: *See*—
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Lapidus, Milton: *See*—
Alburn, Harvey E.; Clark, Donald E.; Grant, Norman H.; and Lapidus, Milton, 3,703,542.
Alburn, Harvey E.; Clark, Donald E.; Grant, Norman H.; and Lapidus, Milton, 3,703,543.

Lareau, Norman N., to Eastman Kodak Company. X-ray film cassette with identification exposure window and exposure indicator. 3,703,272, Cl. 250-67.000.

Larsen, Helge: *See*—
Palyi, Leslie; and Larsen, Helge, 3,703,200.

Larson, William M.; and Jackson, William E., to Goodyear Tire & Rubber Company, The. Method of making polyester laminates. 3,703,426, Cl. 156-308.000.

Lasco, Ralph H., to Diamond Shamrock Corporation. Sequestering agents for metal ion contamination of alkyl-aromatic hydrocarbons. 3,703,473, Cl. 252-188.300.

Laun, Charles L., III, to Goodyear Tire & Rubber Company, The. Vehicle wheel and brake with heat shield. 3,703,317, Cl. 301-6.00r.

Lauro, Luciano: *See*—
Pomella, Piero; and Lauro, Luciano, 3,703,327.

Laverda, Pietro, to Pietro Laverda S.p.A. Device for automatic self-levelling of the body of a threshing-harvesting machine. 3,703,298, Cl. 280-6.00h.

Lawrence Manufacturing Company: *See*—
Hamilton, William H.; and Winsor, Jack O., 3,703,314.

Leach, George J., to Chartered Enterprises, mesne. Binder for water skis. 3,703,013, Cl. 9-310.0aa.

Leaper, Joseph Michael Faraday; and Raman, Harvey Peter John, to Amchem Products, Inc. Preparation of 3-amino-2,5-dichlorobenzoic acid. 3,703,546, Cl. 260-518.00a.

Learning Appliances Limited: *See*—
Rubenstein, Leonard, 3,703,608.

Lechner, Walter Ludwig: *See*—
Masson, Narinder; Korenicki, William John; and Lechner, Walter Ludwig, 3,703,098.

Lee, Alex Y.: *See*—
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Lee, Richard J.: *See*—
Piasek, Edmund J.; Karll, Robert E.; and Lee, Richard J., 3,703,536.

Lemler, Seymour A. Scoop for animal waste. 3,703,158, Cl. 119-1.000.

Leningradskoe Proektno-Experimetalnoe Otdelenie Vsesojuz-Nogo Gosudarstvennogo Nauchno Issledovatelskogo i Proekt-Nogo Instituta Vniiproektelektromontash, Dnepropetrovskaya ulitsa: *See*—
Povolotsky, Aron Markovich; Sushkin, Vyacheslav Petrovich; Fateichev, Anatoly Semenovich; and Gavrilov, Nikolai Vasilievich, 3,703,025.

Lerich, Lester. Expansion bolt. 3,703,119, Cl. 85-67.000.

Les-Kare, Inc.: *See*—
Glass, Neel W., 3,703,209.

Lever Brothers Company: *See*—
Martin, Donald J., 3,703,583.

Levesoue, Norman R.; and Harper, Donald E., to Circuit-Stik, Inc. Rub-on sub-element for electronic circuit board. 3,703,603, Cl. 174-68.500.

Levine, Charles A., to Dow Chemical Company, The. Process for generating electrical energy comprising melting the anode metal in the reservoir prior to melting the anode metal in the electrolyte fibers. 3,703,412, Cl. 136-6.000.

Levine, Ralph, to Cities Service Company. Process for preparing a pure hydrogenated cycloolefin. 3,703,558, Cl. 260-666.00p.

Levinn, Robert N., to American Thermostat Corporation. Liquid level sensing system. 3,703,693, Cl. 337-1.000.

Levy, Leon B., to Celanese Corporation. Process for the conversion of olefins to unsaturated aldehydes and acids. 3,703,551, Cl. 260-533.000.

Lewis, Fred I. Vehicle seat belt non-use warning signal switch mounting. 3,703,618, Cl. 250-85.00r.

Leyland Gas Turbines Limited: *See*—
Barnard, Mark Cary Sedgwick, 3,703,206.

Liebert, Oskar; and Theilacker, Klaus, to Maschinenfabrik Augsburg-Nurnberg AG. Sheet feeding apparatus having gripper control, for use with printing machines. 3,703,281, Cl. 271-79.000.

Lietz, Ernst, G.m.b.H.: *See*—
Bromer, Heinz; and Meinert, Norbert, 3,703,389.

Lin, Chao-Han; and Wright, Arthur J., to National Cash Register Company, The. Mark-forming record materials and process for their use. 3,703,397, Cl. 117-36.200.

Lincks, Hans; and Weigmann, Erich W., to Messerschmitt-Bolkow-Blohm GmbH. Control unit for the lift engines of vertical and short takeoff aircraft. 3,703,266, Cl. 244-52.000.

Lindemann, Martin K. Fusible thermosetting powder resin and production thereof. 3,703,499, Cl. 260-77.5at.

Linden, Henry R., to Institute of Gas Technology. Process for production of pipeline quality gas from oil shale. 3,703,052, Cl. 48-215.000.

Lipowski, Stanley A.; and Queen, John C., Jr., to Diamond Shamrock Corporation. Polyacrylamide-epoxidized aminoplast-urea condensates. 3,703,563, Cl. 260-836.000.

List, Hans: *See*—
Schreiber, Erich; Freyn, Fritz; and Noraberg, John, 3,703,178.

Little, William S., Jr.; and Townsend, Robert H., to Xerox Corporation. Liquid applicator. 3,703,459, Cl. 204-300.

Lock, Michael V., to Deering Milliken Research Corporation. Two step modification of textile materials. 3,703,351, Cl. 8-116.300.

Locke, John Michael: *See*—
Duck, Edward William; Locke, John Michael; and Amass, Allan John, 3,703,566.

Loewe Opta G.m.b.H.: *See*—
Dennewitz, Rolf Dieter; and Breitkreuz, Lutz, 3,703,662.

London, Arnold, to Motorola, Inc. Photocurrent cross talk isolation. 3,703,669, Cl. 317-235.000.

Long, Thomas F.: *See*—
Beyer, Henry R.; Long, Thomas F.; and De Sipio, Richard G., 3,703,719.

Longin, Mikail Lvovich: *See*—
Dovgalev, Stepan Ilich; Ermolenko, Igor Nikolaevich; Buglov, Evgeny Danilovich; Danilov, Ivan Petrovich; and Longin, Mikail Lvovich, 3,703,438.

Longwell, John P., to Esso Research and Engineering Company. Hybrid rocket propellant using polymeric sponge and liquid oxidizer. 3,703,080, Cl. 60-219.000.

Losee, Walter J., to Atlas Engineering Products, Inc. Construction element with anchor teeth. 3,703,304, Cl. 287-20.92l.

Love, J. E., Company: *See*—
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Luebs, Donald F.; and Ashby, Frederick R., to Champion International Corporation. Apparatus for making textured panels. 3,703,198, Cl. 144-2.00r.

Lugiewicz, Robert C., to Cubb-Pac Corporation. Packaging of meat. 3,703,064, Cl. 53-122.000.

Lugo, Luigi; Gualdi, Girogio; and Reni, Cesare, to Societa' Italiana Resine S.p.A. Method of preparing phthalic acids. 3,703,547, Cl. 260-524.00r.

Lugscheider, Walter, to Siemens Aktiengesellschaft. Method of coating niobium with copper. 3,703,447, Cl. 204-37.00r.

Lukens Steel Company: *See*—
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Lummus, James L.; and Field, Leroy J., to Pan American Petroleum Corporation. Vertical separator for drilling fluids. 3,703,467, Cl. 210-522.000.

Lunel, Jean: *See*—
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Lusti, John; and Doane, John Charles, to Otis Elevator Company. Solid state control system. 3,703,222, Cl. 187-29.00r.

Lutz, Warren R. Basketball apparatus including a past stabilizing slot. 3,703,291, Cl. 273-85.00r.

Lystad, Leonard A., to General Motors Corporation. Dual configuration vehicle body. 3,703,310, Cl. 296-15.000.

Macleod, David E., to Carrier Corporation. Self-contained air conditioning unit. 3,703,087, Cl. 62-262.000.

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Maeda, Kazuo, to Mitsui Shipbuilding and Engineering Co., Ltd. Method for building ships. 3,703,153, Cl. 114-77.00r.

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Magnatex Limited: *See*—
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Maher, Pat. Tank heater. 3,703,167, Cl. 126-350.00r.

Maida, Osamu, to Nippon Kogaku. Timer for a camera. 3,703,649, Cl. 307-293.000.

Maierson, Theodore; Roe, Harry L., Jr.; and Williams, James E., to National Cash Register Company, The. Pre-fluxed solder powder. 3,703,254, Cl. 228-56.000.

Maiocchi, Luigi, to Industrie Pirelli S.p.A. Tread ring for removable tread tires. 3,703,202, Cl. 152-175.000.

Maksymiak, John; and Hart, Lawrence M., to Xerox Corporation. Method and apparatus for forming a uniform layer of powder developer on a surface. 3,703,157, Cl. 118-637.000.

Malkemus, John D.; and Bell, John B., to Jefferson Chemical Company, Inc. Production of anhydrous β-hydroxyalkyl carbamates. 3,703,538, Cl. 260-482.00c.

Mallinckrodt Chemical Works: *See*—
Baron, Frank A., 3,703,598.

Mallory, James D.: *See*—
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Malmstrom, Sven Erik, to Forsheda Gummifabrik AB. Sealing between a rotary and a stationary member. 3,703,296, Cl. 277-25.000.

Mama, Hiromichi: *See*—
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Manganaro, James L.: *See*—
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Mannheimer, Hans S. Diamido amino sulfonates and methods for preparing same. 3,703,535, Cl. 260-401.000.

Marion, Thomas E.; and Priborsky, Godfrey M., to Maryland Cup Corporation. Apparatus for feeding heat shrinkable plastic film and capping containers therewith. 3,703,066, Cl. 53-296.000.

Marki, Gustav Paul: *See*—
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Marradi, Renato. Automatic tray-loading device for cigarette packaging machines. 3,703,242, Cl. 214-302.000.

Marshall, Claude J., to North American Rockwell Corporation. Retaining means for wheel trim members. 3,703,318, Cl. 301-37.00r.

Martin, Clyde J., to Martin Industries, Inc. Gauge actuated circuit control unit. 3,703,616, Cl. 200-56.00r.

Martin, Donald J., to Lever Brothers Company. Anticalculus formulations. 3,703,583, Cl. 424-54.000.

Martin Industries, Inc.: *See*—
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Marx, Matthias; Becker, Ernst; and Spoor, Herbert, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Coating compositions for electrodeposition. 3,703,596, Cl. 260-29.6ta.

Maryland Cup Corporation: *See*—
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Masson, Narinder; Korenicki, William John; and Lechner, Walter Ludwig. Compound fluid meter. 3,703,098, Cl. 73-231.00r.

Mast, Phillip W.; and Beaubien, Laurent A., to United States of America, Navy. Close packing of uniform size spheres. 3,703,012, Cl. 9-8.000.

Masuda, Shiro; Ohkubo, Takashi; and Furukawa, Yu, to Denki Kagaku Kogyo Kabushiki Kaisha. Process for the preparation of aqueous emulsions of water-resistance vinyl acetate-ethylene copolymers. 3,703,492, Cl. 260-27.0ev.

Matsue, Shigeki, to Nippon Electric Company, Ltd. High speed associative memory circuits. 3,703,709, Cl. 340-173.0ff.

Matsumoto, Seiji: *See*—
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McAtee, Jon R., to Microdyne Corporation. Microwave varactor-tuned resonator for preselector. 3,703,689, Cl. 333-82.00b.

McCartney, Roger L., to Celanese Coatings Company. Vinylnorbornene/maleic anhydride copolymers and process of preparing same. 3,703,501, Cl. 260-78.50r.

McCaw, Thomas M. Differential. 3,703,108, Cl. 74-713.000.

McCrary, Avis L., to Dow Chemical Company, The. Polyalkylenepolyamines with N-(2-hydroxy-3-sulfopropyl) groups. 3,703,545, Cl. 260-513.00n.

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McKinney, John S., to American Metal Climax, Inc. Sheet metal roofing/siding system with seperable fastener. 3,703,062, Cl. 52-545.000.

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Merck & Co., Inc.: *See*—
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Meriz, Miquel Casas. Adjustable support beam. 3,703,269, Cl. 248-354.00l.

Merkle, Alfred; Schlicker, Volker; and Wrobel, Gunter, to Papst-Motoren KG. Lubrication device for rotation machine parts. 3,703,221, Cl. 184-6.270.

Merlin Gerin, Societe Anonyme: *See*—
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Merrill, Stewart H., to Eastman Kodak Company. Photoconductive elements containing polymeric binders. 3,703,371, Cl. 96-1.600.

Merrill, Stewart H., to Eastman Kodak Company. Photoconductive elements containing polymeric binders. 3,703,372, Cl. 96-1.600.

Messerschmidt, Friedrich, to Bosch, Robert, G.m.b.H. Sealing means for fuel injection valves. 3,703,184, Cl. 137-509.000.

Messerschmitt-Bolkow-Blohm GmbH: *See*—
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Middleton, Edward Benjamin. Rotatable opening container closure. 3,703,249, Cl. 222-597.000.

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Mimlitch, Kenneth H. Self-centering marking device. 3,703,142, Cl. 101-382.0mv.

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Moyroud, Louis M. Photocomposing machine. 3,703,138, Cl. 95-4.50r.
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Murakami, Tadao; Kikuchi, Ken; Tomozaki, Riyouzou; and Ohuchi, Yasushi, to Hitachi, Ltd. Electromagnetic clutch. 3,703,227, Cl. 192-84.00c.
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Nakano, Mamoru; Kadowaki, Koju; Komurao, Isao; Koshikawa, Takeo; and Oshida, Bunzi, to Mitsubishi Petrochemical Co., Ltd. Process for preparing unsaturated aldehydes and unsaturated carboxylic acids. 3,703,550, Cl. 260-533.00n.
Nakase, Yoshiaki; Yoshida, Masaru; Ito, Akihiko; Iwai, Tadashi; Hayashi, Koichiro; Okamura, Seizo; and Kojima, Katsumi, to Japan Atomic Energy Research Institute. Polymerization of tetraoxane in the presence of sulfur and sulfur compounds. 3,703,454, Cl. 24-159.210.
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O'Connor, Alton J., to Walbro Corporation. Fuel pump bellows construction. 3,703,342, Cl. 417-326.000.
O'Connor, Chadwell. Steam boiler. 3,703,161, Cl. 122-235.00r.
Ogata, Nobutaka; Kumamoto, Riyouzi; and Asada, Shuzi, to Matsushita Electric Industrial Co., Ltd. Steam iron. 3,703,043, Cl. 38-77.830.
Ogura, Mitsuo; and Itoh, Satoshi, to Hitachi, Ltd. Record verification apparatus. 3,703,706, Cl. 340-146.1ba.
Ohkubo, Takashi: *See—*
Masuda, Shiro; Ohkubo, Takashi; and Furukawa, Yu, 3,703,492.
Ohnishi, Shigekazu; Nishishita, Masaharu; and Takimoto, Hisateru, to Kuraray Co., Ltd. Method for manufacturing sheet material exhibiting a highly glossy surface. 3,703,403, Cl. 117-64.00c.
Ohnuma, Kiyoshi: *See—*
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Okabe, Tadao; Oikawa, Mitsuru; Tanaka, Makoto; and Nagashiro, Waichi, to Hitachi, Ltd. Method of manufacturing color picture tube. 3,703,374, Cl. 96-36.100.
Okada, Shigetaka; Tsuyama, Naoto; Kurimoto, Masahi; and Sugimoto, Kaname, to Kayashibara Company. Process for the production of starch syrups that have fructose on their molecular ends. 3,703,440, Cl. 195-31.50r.
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Okamura, Seizo: *See—*
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Olin Mathieson Chemical Corporation: *See—*
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Oliver, Kenneth L., to Sperry Rand Corporation. Control wheel force sensors. 3,703,267, Cl. 244-83.00e.
Olympia, Frederick D.: *See—*
Clishem, Thomas A.; Duerr, Francis r.; and Olympia, Frederick D., 3,703,391.
Olympia Werke AG: *See—*
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Ono, Hisatake; and Osada, Chiaki, to Fuji Photo Film Co., Ltd. Pressure sensitive copying paper. 3,703,398, Cl. 117-36.200.
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Sato, Katsumi; Nakamura, Takashi; Nakamura, Masaru; Hirasawa, Kazuo; Hamada, Mitsuo; Takahashi, Kenzi; Yashima, Masaaki; Ozaki, Toshiaki; Yamamoto, Sigeo; Ooishi, Tadashi; Fujinami, Akira; Horiuchi, Fukashi; and Nodera, Katsuji, 3,703,526.
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Orosztan, Andrew; and Tesoro, Giuliana C., to Stevens, J. P., & Company, Inc. Unsymmetrical aziridinyl compounds. 3,703,509, Cl. 260-239.00e.
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Parke, Davis & Company: *See—*
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Patel, Arvind M., to International Business Machines Corporation. Multi-channel shift register. 3,703,705, Cl. 340-146.1al.
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Pauliukonis, Richard S. Plastic actuating cylinder. 3,703,125, Cl. 92-85.000.
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Payne, Sumas. Vehicle theft signalling device. 3,703,703, Cl. 340-63.000.
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Peppers, Norman A.: *See—*
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Perilstein, Warren L., to Ethyl Corporation. Gasoline additive and composition. 3,703,360, Cl. 44-63.000.
Pernoud, Claude, to Regie Nationale des Renault and Automobiles Peugeot. Air vent devices for air conditioning systems. 3,703,141, Cl. 98-121.00r.
Perry, James T., 1/2 to Philip H. Willkie. Pitcher's mound with toe block and reinforcing ribs. 3,703,285, Cl. 273-25.000.
Peschel, Stanley G., to Hipotronics, Inc. Mechanically adjustable high voltage inductive reactor for series resonant testing. 3,703,692, Cl. 336-134.000.
Peterson, George Earl: *See—*
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Philip H. Willkie: *See—*
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Piasek, Edmund J.; Karll, Robert E.; and Lee, Richard J., to Standard Oil Company. Preparation of oil-soluble boron derivatives of complex substituted alkylene polyamine. 3,703,536, Cl. 260-462.00r.

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Piret, Jean, to Regie National des Usines Renault and Automobiles Peugeot. Automotive transverse-mounted power units. 3,703,107, Cl. 74-695.000.

Pivar, Stewart, to Rototron Corporation. Apparatus for molding hollow objects from thermoplastic materials. 3,703,348, Cl. 18-26.

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Pohm, Arthur V.; and Zingg, Roy J., to Iowa State University Research Foundation. Variable diameter disc pack with cooperating head. 3,703,713, Cl. 340-174.10c.

Poling, Ezar C.; and Botsford, Charles E., to Eastman Kodak Company. Apparatus for resetting the corner of deep-drawn laminated articles. 3,703,428, Cl. 156-382.000.

Pomella, Piero; and Lauro, Luciano. Control devices. 3,703,327, Cl. 318-571.000.

Porte, Gilbert R. A.: *See—*
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PPG Industries, Inc.: *See—*
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Prachar, Otakar P., to General Motors Corporation. Multidirectional sensor. 3,703,102, Cl. 73-514.000.

Pravaz, Marcel, to Etudes et Fabrications Aeronautiques. Parachute container and the application of the container to a parachute. 3,703,268, Cl. 244-148.000.

Pressley, Arther Mitchell: *See—*
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Rammler, Roland; and Schmalfeld, Paul, to Metallgesellschaft Aktiengesellschaft. Method for the low-temperature distillation of finely granular bituminous materials which form a pulverulent residue in the process. 3,703,442, Cl. 201-12.000.

Randle, Dee, to Swan Trailers Inc. Trailer hitch. 3,703,301, Cl. 280-438.000.

Randoing, Jean Martial: *See—*
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Rank, John B.: *See—*
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Rasmussen, Tom: *See—*
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Ravenscroft, Ivor Albert; and Jackson, Lynden Ashbrooke, to Post Office, The. Dielectric waveguides. 3,703,690, Cl. 333-95.00s.

Ravimohan, Arakali L.: *See—*
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RCA Corporation: *See—*
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Goldmacher, Joel E.; and Heilmeier, George H., 3,703,331.
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Read, Benjamin Hays; and Black, Rexford E., to Signetics Corporation. Electrolytic etch apparatus. 3,703,458, Cl. 204-198.000.

Recognition Equipment Incorporated: *See—*
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Reece, Thomas L.; and Bryant, Thurman E., to Dover Corporation, mesne. Filter with rotating backwash selector. 3,703,465, Cl. 210-333.000.

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Regie Nationale des Usines Renault: *See—*
Remaud, Jacques C.; and Bouthors, Pierre, 3,703,320.

Reitter, Teodoro. Internal combustion rotary engine. 3,703,344, Cl. 418-61.000.

Rejmaniak, Susan English: *See—*
Gomersall, Earl Raymond; Meyer, Roger Paul; and Rejmaniak, Susan English, 3,703,725.

Remaud, Jacques C.; and Bouthors, Pierre, to Regie Nationale des Usines Renault and Automobiles Peugeot. Braking system control and anti-lock devices. 3,703,320, Cl. 303-21.00f.

Renaut, Jacques: *See—*
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Reni, Cesare: *See—*
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Rex Chainbelt, Inc.: *See—*
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Rice, George A.: *See—*
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Rice, James S., to Industrial Nucleonics Corporation. Anticipatory control of headbox slice opening in a paper machine. 3,703,436, Cl. 162-198.000.

Rich, Joseph L. Apparatus for fabricating plastic cushioning an insulating material. 3,703,430, Cl. 156-497.000.

Richmond, Ernest L.: *See—*
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Richter, Carl; Pluss, Kurt; and Feth, Georg, to Cilag-Chemie, A.G. Adamantyl urea derivatives. 3,703,537, Cl. 260-468.00b.

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Riffkin, Charles; Rifino, Carl B.; and Cyr, Gilman N., to Squibb, E. R., & Sons, Inc. α-aminobenzyl penicillins. 3,703,511, Cl. 260-239.001.

Rifino, Carl B.: *See—*
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Rigsby, Canby A., Sr., to Globe-Union Inc. Battery and method of making the same. 3,703,589, Cl. 136-134.00r.

Riviers, Marie. Drawer divider and drawer organizer. 3,703,326, Cl. 312-330.000.

Roberts, Arthur H. Method of casting rigid foam to support a hollow flexible plastic shell. 3,703,571, Cl. 264-45.000.

Robinson, Seymour. Ultrasonic dental hand-piece with detachable treatment tools. 3,703,037, Cl. 32-58.000.

Rock Fall Company Limited: *See—*
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Roe, Harry L., Jr.: *See—*
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Roeder & Spengler OHG: *See—*
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Roland Offselmaschinenfabrik Faber: *See—*
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Rosa, Albert G.; and Birrer, George W., to McDonnell Douglas Corporation. Heat sealed flexible envelope separator and battery embodying same. 3,703,417, Cl. 136-145.000.

Rose-Miller, Brigadier George Patrick. Container for transport of animals. 3,703,159, Cl. 119-19.000.

Rosen, Fred D., to North American Rockwell Corporation. Particle-size measuring apparatus. 3,703,641, Cl. 250-218.000.

Rosen, Karl Isac Joel. Combined thread-feeding and lubricating device for knitting machines. 3,703,090, Cl. 66-132.00r.

Rosenkaimer GmbH: *See—*
Uthemann, Wolfgang; and Zimmermann, Richard (said Zimmermann assor. to), 3,703,182.

Ross, Donald R. Folding box. 3,703,256, Cl. 229-39.000.

Rosse, Thomas A.; Blackmer, David E.; Zindler, Jerrold; and Kelley, Thomas F., to Analysis system employing a plural chamber cuvette. structure. 3,703,336, Cl. 356-39.000.

Roth, Shirley H.: *See—*
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Roth, Shirley H., to Cities Service Company. Aminobenzoic acid sulfates as intumescent agent. 3,703,409, Cl. 117-136.000.

Roth, Shirley H., to Cities Service Company. 5-Amino-2-nitrobenzoic acid as an intumescent agent. 3,703,410, Cl. 117-136.000.

Rothweiler, Werner B., to Ciba-Geigy Corporation. Preparation of benzilic acid compounds. 3,703,597, Cl. 260-520.000.

Rototron Corporation: *See—*
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Rouse, William, to Imperial Chemical Industries, Limited. Pressure transducer. 3,703,099, Cl. 73-398.0ar.

Rowe, Geoffrey Whaley: *See—*
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Rubenstein, Leonard, to Learning Appliances Limited. Amplifier switching means for a telephone answering device. 3,703,608, Cl. 179-6.00r.

Russ, Mark A.: *See—*
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Russell, Arvin E. Towing dolly. 3,703,240, Cl. 314-86.00a.

Russell, Dale F. Ventilated toilet. 3,703,010, Cl. 4-216.000.

Ruyle, William V.: *See—*
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Ryan, Thomas J.: *See—*
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Ryckman, William D., Jr., to General Electric Company. Oral hygiene apparatus. 3,703,170, Cl. 128-66.000.

Saccomano, Joseph M.; and Ellis, John D., Jr., to Joslyn Manufacture and Supply Co. Reactor. 3,703,279, Cl. 266-41.000.

Saito, Kimihiko: *See—*
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Saito, Norio; and Kimura, Hiroshiro, to Norio Saito and Unitika, Ltd. Method for imparting antistatic properties to polymeric materials. 3,703,588, Cl. 117-138.80b.

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Sakamoto, Eiichi: *See—*
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Sakazume, Kaiichiro; Sakamoto, Eiichi; Itoh, Shigemasa; Fujimori, Noboru; and Baba, Shigeji, to Konishiroku Photo Industry Co., Ltd. Supersensitized light-sensitive silver halide photographic emulsion. 3,703,377, Cl. 96-122.000.

Sakurada, Ichiro; Okada, Toshio; and Uragami, Motoaki, to Japan Atomic Energy Research Institute. Process for manufacturing a durable oily stain resistant polyester fiber, and its product. 3,703,406, Cl. 117-118.000.

Salkeld, Melvin R.: *See—*
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Salmon, David; Wierzbicki, Edward J.; Langston, Benny; and Beegle, Donald W., to U. S. Reduction Co. Mechanical puddler. 3,703,340, Cl. 416-79.000.

Samler, Lee F.; and Boone, John J., to Esso Research and Engineering Company. Carpet backing. 3,703,197, Cl. 117-138.80e.

Sandor, Bela: *See—*
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Sandoz-Wander, Inc.: *See—*
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Takahashi, Shogo; Yamada, Takayasu; and Okudaira, Hiromi, 3,703,365.

Santiago, Andres; and Santiago, Enrique, to Zeuna-Staerker KG. Apparatus for the detoxification of exhaust gases of internal combustirn engines. 3,703,082, Cl. 60-282.000.

Santiago, Enrique: *See—*
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Kim, Dong H.; and Santilli, Arthur A., 3,703,517.

Sargent, Thomas J. Molded granite. 3,703,433, Cl. 161-162.000.

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Sato, Katsumi; Nakamura, Takashi; Nakamura, Masaru; Hirasawa, Kazuo; Hamada, Mitsuo; Takahashi, Kenzi; Yashima, Masaaki; Ozaki, Toshiaki; Yamamoto, Sigeo; Ooishi, Tadashi; Fujinami, Akira; Horiuchi, Fukashi; and Nodera, Katsuji, to Sumitomo Chemical Co. Lt. and Hokko Chemical Industry Co., Ltd. Novel 3-(3,5-dichlorophenyl)oxazolidine-2,4-dione derivatives. 3,703,526, Cl. 260-357.00b.

Sato, Masamichi: *See—*
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Saucy, Gabriel, to Hoffmann-La Roche Inc. Preparation of Mannich-bases. 3,703,527, Cl. 260-307.000.

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Sawchuk, Loris G.: *See—*
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Schaaf, Ronald L., to Minnesota Mining and Manufacturing Company. Heat-activatable adhesive sheets. 3,703,434, Cl. 161-167.000.

Schaefer, Hans: *See—*
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Schenavar, Harold E.; and Pierce, Irving L. Quick-detachable outrigger fishing device. 3,703,047, Cl. 43-43.150.

Schiavitto, Charles A. Athletic knee supporter and protective device. 3,703,171, Cl. 128-80.00c.

Schiesterl, Gerhard; and Wulf, Helmut, to Daimler-Benz Aktiengesellschaft. Seat, especially for motor vehicles. 3,703,313, Cl. 297-391.000.

Schiesterl, Gerhard; and Eibl, Josef, to Daimler-Benz Aktiengesellschaft. Automotive vehicle warning device with all position ignition key circuit actuation via steering lock. 3,703,704, Cl. 340-64.000.

Schleicher AG: *See—*
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Schleinkofer, Rudi William, to Sunds Aktiebolag. Method for finely disintegrating pulp, preferentially cellulose pulp, in connection with the bleaching thereof with gaseous bleaching agent. 3,703,435, Cl. 162-17.000.

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Schmitt, Roman A. Anti-fog headlight with opaque mask. 3,703,636, Cl. 240-46.430.

Schmitt, William H.: *See—*
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Schoonover, Richard H. A., to Formac International, Inc., mesne. Track assembly for tracked vehicles. 3,703,321, Cl. 305-38.000.

Schramm, Lester H.; Rank, John B.; and Salkeld, Melvin R., to Rex Chainbelt, Inc. Traversing bridge friction drive alignment control. 3,703,016, Cl. 15-246.500.

Schreiber, Erich; Freyn, Fritz; and Noraberg, John, to List, Hans. Single-cylinder internal combustion engine. 3,703,178, Cl. 184-6.500.

Schulz, Werner: *See—*
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Schuster, Ludwig: *See—*
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Schwarz, Gerhard, to Compur-Werk Gesellschaft mit beschrankter Haftung & Co. Photographic camera with interchangeable objective shutter. 3,703,136, Cl. 95-42.000.

Schwarz, Rudolf, to Staubli AG. Heddle frame lift device. 3,703,195, Cl. 139-71.000.

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SCM Corporation: *See—*
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Scott, William W., Jr., to Lukens Steel Company. Method of starting electroslag remelting process with molten slag. 3,703,600, Cl. 13-9.000.

Scovil, Henry Evelyn Derrick: *See—*
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Scudder, Philmore M., to Sun Oil Company. Thiourea pseudocumene adduct. 3,703,503, Cl. 260-96.50t.

Seaton, William W., to Patusa Aktiengesellschaft. Foundry stopper having parallelogram rigging. 3,703,248, Cl. 222-504.000.

Seeburg Corporation of Delaware, The: *See—*
Wrabel, James A., 3,703,648.

Seiferth, Oscar E.; and Austin, Glenn M., to Oscar Mayer & Co., Inc. Easily opened bacon package. 3,703,384, Cl. 99-174.000.

Seiler, Lazar I.; and Nicholas, James P., to Yankee Metal Products Corporation. Replacement windshield wiper unit. 3,703,018, Cl. 15-250.420.

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Sekmakas, Kazys, to DeSoto, Inc. Electrocoating method based on copolymers containing maleic half esters. 3,703,455, Cl. 204-181.000.

Selander, Bror Olle Herbert, to AB Spacio System Malmo. Locking mechanism for vertically adjustable drawing boards. 3,703,147, Cl. 108-145.000.

Selby, Jack H., to Warner & Swasey Company, The. Machine tool with bar feed control. 3,703,112, Cl. 82-2.500.

Sellers, John C.; and Schneiter, John W. Thermal impulse sealing bar assembly. 3,703,427, Cl. 156-359.000.

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Shair, Fredrick H.; and Ravimohan, Arakali L., to United States of America, Atomic Energy Commission. Non-equilibrium plasma reactor for natural gas processing. 3,703,460, Cl. 204-327.000.

Shanks, John L., to Amoco Production Company. Recursion filter. 3,703,632, Cl. 235-152.000.

Shanrock, Raymond L., to Data Recognition Corporation. Document transport apparatus and method. 3,703,626, Cl. 235-61.11r.

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Sharp, Allen W. Poultry processing method and apparatus. 3,703,021, Cl. 17-47.000.

Shaw, Irving Franklin; and Hinden, Stephen David, to West Laboratories, Inc. Pine-ammonia detergent composition. 3,703,472, Cl. 252-107.000.

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Shenshev, Leonid Vladimirovich. Machine for teaching foreign languages. 3,703,602, Cl. 35-35.00c.

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Sias, Roy C., to Continental Oil Company. Preparation of oil soluble sulfonic acids useful as dispersant additives. 3,703,475, Cl. 252-353.000.

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Silvandersson, Jonnie Thor-Leif, to AB Akerlund & Rausing. Method of and apparatus for producing a tubing from a strip of material. 3,703,252, Cl. 228-15.000.

Simms, James S. Improvements in tensioning devices. 3,703,030, Cl. 29-252.000.

Simopoulos, Nicholas T.; and Tsui, James B. Y., to Labtron Corporation of America. Multiband antenna with associated R. F. amplifier. 3,703,685, Cl. 325-373.000.

Simpson, Robert O. Radial wire tire having improved sidewall cut resistance. 3,703,203, Cl. 152-354.000.

Simpson, Roy: *See—*
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Simsack, Anton. Self contained solder iron kit. 3,703,624, Cl. 219-229.000.

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Skupas, John A.; and Godwin, Robert H., to Bliss & Laughlin Industries, Inc. Anti-fouling caster, swivel-type. 3,703,020, Cl. 16-31.000.

Skvortsov, Boris Vasilievich: *See—*
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Smatkr, Joseph S., to McDonnell Douglas Corporation. Low-gassing battery separator and method of production. 3,703,414, Cl. 136-30.000.

Smidth, F. L., & Co.: *See—*
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Smith, Carroll G. Combination rotatable oil dip stick and wiper. 3,703,038, Cl. 33-126.70r.

Smith, George W. Sewage treatment apparatus and method. 3,703,462, Cl. 210-7.000.

Smith, Gordon E., to Medidyne Corporation. Method and apparatus for catheter injection. 3,703,174, Cl. 128-214.400.

Smith, Lee E. Chest. 3,703,324, Cl. 312-279.000.

Smith, Max D.; and Adkins, Frank M., to Indian Industries, Inc. Net holder for table tennis table. 3,703,287, Cl. 273-30.000.

Smith, Sally J. Portable hand-operated pressing device for clothing or the like. 3,703,042, Cl. 38-69.000.

Smith, William; and McGrath, Charles E. Machine tool guard and/or safety shield. 3,703,124, Cl. 90-11.00r.

Snyder, Thomas P.: *See—*
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Spaeth, Irvin J., to Evans Products Company. Railway brake gear bottom rod guard. 3,703,225, Cl. 188-210.000.

Spanos, Theodore, III; and Godar, Richard L., to Petrolite Corporation. Use of poly-ester-amide-acids as rust or corrosion inhibitors. 3,703,587, Cl. 21-2.500.

Sparks, Charles H. Cloth reinforcing member for use in making tissue grafts. 3,703,009, Cl. 3-1.000.
Spectral Data Corporation: *See—*
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Stewart, Gloria. Finger ring display glove. 3,703,007, Cl. 2-63.000.
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Attwood, Terence E., J. B. Rose, and A. F. Lennox, to Imperial Chemical Industries Ltd. Aromatic polymers. T904,027, 11–21–72, Cl. 260—49.

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53 : 225,180

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

1 : T904,031
1 : T904,033
8 : T904,030

9 : T904,020
10 : T904,021
26 : T904,023

34 : T904,025
36 : T904,018
T904,022

T904,024
T904,026
T904,028

T904,032
T904,034

48 : T904,035
T904,019

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